AN INNOVATIVE APPROACH TO REDUCING PROSTATE CANCER HEALTHCARE DISPARITIES FOR AT-RISK AFRICAN AMERICAN MEN: DEVELOPMENT AND EVALUATION OF AN ONLINE E-HEALTH AVATAR VIDEO TAILORED TO BE CULTURALLY APPROPRIATE

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ABSTRACT

AN INNOVATIVE APPROACH TO REDUCING PROSTATE CANCER HEALTHCARE DISPARITIES FOR AT-RISK AFRICAN AMERICAN MEN: DEVELOPMENT AND EVALUATION OF AN ONLINE E-HEALTH AVATAR VIDEO TAILORED TO BE CULTURALLY APPROPRIATE

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There is a need to increase awareness among African American men regarding their potential risk of prostate cancer and inform them of screening and treatment options, given the health disparities that affect their group. To do so, an innovative e-health video was developed, using an animated avatar video to educate African American males about prostate cancer and potential screening methods in a way that is culturally appropriate. Effectiveness of this e-health intervention was tested on a sample of 41 African American males. Efficacy was measured using a repeated measures design that used pre- and post-measures of four target behaviors regarding prostate cancer screening. These four target behaviors include: (1) getting an annual physical exam, (2) discussing the possibility of getting a digital rectal exam to screen for prostate cancer with a doctor, (3) discussing the possibility of getting a PSA exam to screen for prostate cancer with a doctor, and (4) spreading awareness about prostate cancer among other African American men. The stage of change, which is a theoretical framework adapted from Prochaska and DiClemente (1983), measures changes in human behavior from precontemplation and contemplation on the low end to action and maintenance on the high end. Self-efficacy was also measured before and after the

intervention for each of the four target behaviors. Paired t-tests show that the stage of change for the third and fourth target behaviors and self-efficacy for the second, third, and fourth target behaviors were significantly increased by the e-health intervention, indicating that the intervention was successful. Additionally, participant ratings about the intervention were largely positive. In effect, this study finds that the e-health intervention developed in this study not only works, but is an affordable, scalable, and practical tool that can educate African American males about prostate cancer screening practices.

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Chapter I

INTRODUCTION

Mullins, Onukwugha, Bikov, Seal, and Hussain (2010) explained how health disparities, which are "defined as differences in disease incidence, morbidity, and mortality that exist between specific populations, are more commonly seen in African American populations" (p. 572). According to Hoffman et al. (2001), prostate cancer "is the most frequently diagnosed visceral cancer and the second leading cause of cancer death in men" (p. 388).

Wu and Modlin (2012) reviewed disparities in prostate cancer that involved African American men. They discussed how "African American men are disproportionately affected, with a prostate cancer incidence two-thirds higher than whites and a mortality rate twice as high" (p. 313).

Mullins et al. (2010) examined the influence of race and age disparities and the impact these factors have had on staging prostate cancer in the African American (AA) population; and the increased metastasis that occurs as a result of inaccurate staging. Mullins et al. reported that "African American (AA) men with prostate cancer (PC) have more advanced disease and poorer prognosis than their White counterparts" (p. 566).

Mullins et al. (2010) observed further that "AA patients with localized PC experience shorter disease-free survival than other racial groups" in addition to "multiple factors including socioeconomic status and behaviors contribute to higher PC incidence and mortality among AA men" (p. 566). Mullins et al. reported that " racial disparities

persist even after controlling for socioeconomic status" and although "AA men not only have higher PC incidence and mortality but also PC may be more aggressive in AA men than European American men, particularly at younger ages" (p. 566). Mullins et al. also noted research findings where "AA men were less likely to receive relatively more expensive or innovative treatments" (p. 566). They noted how a lack "of awareness of treatment options and lack of patient education by physicians can affect access to health care" (p. 566).

Hoffman et al. (2001) focused on African American men and the risk factors for prostate cancer—whether demographic, socioeconomic, health insurance, educational, or marital status—drawing upon data from the Prostate Cancer Outcomes Study (PCOS). Hoffman et al. utilized data from the Prostate Cancer Outcomes Study (PCOS), which "was initiated in 1994 to collect individual-level data from a population based cohort of men with newly diagnosed prostate cancer to assess the effects of cancer treatments" (p. 388). Using these data, Hoffman et al. explained how the objective of their analysis "was to use this data to determine the association, if any, between race/ethnicity and prostate cancer clinical stage after adjusting for demographic, socioeconomic, clinical, and pathologic factors" (p. 388).

Hoffman et al. (2001) noted that there are "important racial and ethnic differences" that "exist in prostate cancer epidemiology" (p. 388). More specifically, "African-Americans have the world's highest incidence of prostate cancer and a more than twofold higher mortality rate compared with whites" (p. 388). They suggested that the "excess mortality for African-Americans apparently results from an increased risk for presenting with advanced-stage disease" (p. 388). Hoffman et al. found that African-Americans were "more than twice as likely as whites to present with advanced disease" (p. 393).

Mullins et al. (2010) also discussed how "AA and older men are more likely to be diagnosed with advanced-staged PC, [and] we find that there also is a higher probability that AA and older men with PC will not be staged" (p.572). Mullins et al. concluded that

"based on historical SEER-Medicare data and document that there are disparities among diagnosed PC patients in the probability of being staged," while demonstrating "PC staging did not improve from the years 1998 to 2002 for AA men and older men" (p. 572).

Mullins et al. (2010) discussed how "AA men and also men aged 80 years and older with prostate cancer were less likely to have had their prostate cancer staged compared with non-Hispanic whites and men aged 65-69 years" (p. 572). Hoffman et al. (2001) found that "African-Americans had the highest proportion of advanced disease (12.3%), followed by Hispanics (10.5%) and non-Hispanic whites (6.3%)" (p. 389). Also, "African-Americans and Hispanics were generally younger, less educated, poorer, and less likely to have had a previous PSA test than non-Hispanic whites" (p. 389). Hoffman et al. also found that "African-Americans had the most comorbidity and the highest PSA levels;" and overall "African-Americans (16.8%) and Hispanics (12.9%) had a higher proportion than non-Hispanic whites (10.5%) of poorly differentiated cancers" (p. 389).

Mullins et al. (2010) observed how "when staging did take place, the probability of having distant metastatic disease was higher for AA men and also for all men as they aged, compared with the reference group of 65-69 year olds" (p. 572). Mullins et al. noted that, in part, "the observed disparities in staging may reflect informed patient decision-making, but continued monitoring and education regarding new treatment options should continue for all men with PC" (p. 572).

Hoffman et al. (2001) explained how the racial/ ethnic disparity "in the stage at diagnosis is clinically important because stage strongly predicts survival" (p. 391). Unfortunately, they also reported that the "prostate cancer mortality rate is substantially higher for African-Americans than for non-Hispanic whites" (p. 391).

Hoffman et al. (2001) explained that "African-Americans appeared to have more aggressive cancers because they had the highest overall proportion of poorly

differentiated cancers (16.8%) and were more likely than non-Hispanic whites to have poorly differentiated cancers within all clinical stages" (p. 393).

Wu and Modlin (2012) discussed data indicating that "African American men generally present with disease that is more advanced than in white men" (p. 314). "This historically has been attributed to the fact that African Americans have been less likely to be screened for prostate cancer" (p. 314).

According to Wu and Modlin (2012), "African American men tend to have a higher incidence of prostate cancer, they also tend to have more-aggressive disease (i.e., a higher pathologic grade) at the time of diagnosis, which may contribute to the disparity in mortality rates" (p. 314). They reviewed "a body of evidence supports the contention that prostate cancer is more aggressive in African American men" (p. 314). Other noteworthy findings revealed how "men in Nigeria and Ghana also have a high incidence of prostate cancer, as do men of African descent in the Caribbean islands and in the United Kingdom" (p. 314).

Wu and Modlin (2012) further explained that "potential metastatic disease may be identified in a less timely and accurate manner, as African American men are less likely to undergo pelvic lymph node dissection" (p. 316). They discussed how "even after adjusting for treatment, African Americans continue to have worse survival rates" (p. 316). Also, "African American and Hispanic race were associated with higher all-cause mortality rates" (p. 316).

According to Wu and Modlin (2012), "it is important to understand what mechanisms may underlie these differences and what can be done to narrow the gap" (p. 313). "The disparity may be due to a variety of factors, some socioeconomic and some biologic" (p. 313).

Genetic Factors

Wu and Modlin (2012) discussed how evidence of a "genetic component to the high incidence and mortality rate in African American men comes from epidemiologic studies of men with similar genetic backgrounds" (p. 314). "Chromosome 8q24 variants have been shown in several studies to be associated with prostate cancer risk and are more common in African American men" (p. 314). Wu and Modlin also pointed to "a higher rate of variations in cell apoptosis genes such as *BCL2*11 and tumor suppression genes such as *EphB2* in African American men" (p. 314). Wu and Modlin discussed how these findings "suggest that genetic differences may contribute to the higher prostate cancer incidence and mortality rate seen in African American men" (p. 314).

A Historical Perspective on Screening and Disparities

Fowke, Schlundt, Signorello, Ukoli, and Blot (2005) noted that the "prostate specific antigen (PSA) test and digital rectal examination (DRE) enable the detection of early-stage and organ-confined disease among otherwise asymptomatic men" (p. 333).

Wu and Modlin (2012) also recognized that the "American Urological Association now recognizes that the normal PSA range, in addition to varying along racial lines, also is age-dependent" (p. 315). More specifically, the age range recommendations and suggested normal PSA levels for African American men were provided by Wu and Modlin, while following the work of the Cleveland Clinic Minority Men's Health Center, as shown below:

- Age 40–49: ≤ 2.5 ng/mL
- Age 50–59: ≤ 3.0 ng/mL
- Age 60–69: ≤ 3.5 ng/mL
- Age 70–79: ≤ 4.5 ng/mL
- Age > 80: ≤ 5.0 ng/mL

Wu and Modlin (2012) suggested that medical doctors "must also be aware of racial differences in PSA levels and realize that the predictive value of PSA in the diagnosis of prostate cancer may differ between African Americans and whites" (p. 315). As it turns out, Black men "with or without prostate cancer, have been found to have higher PSA levels" when compared to White men "across all age groups" (p. 315). And, other researchers have found that "African Americans with newly diagnosed localized prostate cancer had higher serum PSA levels than whites" (p. 315).

Wu and Modlin (2012) highlighted important recommendations offered by the American Cancer Society, which recommends that "African American men who have a father or brother who had prostate cancer before age 65 should begin having discussions with their physician on this topic"—and, should provide informed consent to their physicians so as to begin "screening at age 45" (p. 315). According to Wu and Modlin, the National Comprehensive Cancer Network (NCCN) has indicated that the "frequency of PSA screening depends on the individual's PSA level" (p. 315). Further, the National Comprehensive Cancer Network has recommended that "men at high risk be offered a baseline PSA measurement and digital rectal examination at age 40" (p. 315).

Fowke et al. (2005) reported that the American Cancer Society (ACA), "the American Urological Association (AUA), and the American College of Radiology (ACR) have recommended that counseling and annual PSA/DRE screening be offered to men starting at 50 years" (p. 339).

According to Hoffman et al. (2001), both the "American Urological Association and the American Cancer Society" had identified "African-Americans as a high-risk group" and had recommended "annual screening with digital–rectal examination and PSA beginning at age 40 years" (p. 394).

Fowke et al. (2005) also discussed screening recommendations offered by "the American Cancer Society (ACS)" as well as "other groups"—including how they have "created age and race-specific guidelines"; for example, there was the recommendation

for engagement in “annual consultation and screening,” which should begin at age 50 for Caucasian men and at age 45 for African American men and “high-risk men” (p. 334).

Fowke et al. (2005) examined the differences between the African American population and the Caucasian population, while investigating differences in prostate cancer screening by age, socioeconomics, and demographic indices. According to Fowke et al., race “remains a consistent risk factor for prostate cancer incidence and mortality among U.S. men” (p. 333). Also, African-American (AA) men “have a higher incidence and are diagnosed with more advanced cancer compared to Caucasian (CA) men” (p. 333).

Fowke et al. (2005) also reported their own findings, which were consistent “with prior research” (p. 339). More specifically, they found that Caucasian men “older than age 65 were significantly more likely to report a recent PSA test or DRE” (p. 339). Fowke et al. indicated how African American men “were less knowledgeable about prostate cancer screening tests” (p. 333).

Hoffman et al. (2001) highlighted how “African-Americans, particularly in lower socioeconomic groups, are often poorly informed about prostate cancer and are less willing than non-Hispanic whites to participate in screening programs” (p. 393).

Wu and Modlin (2012) also discussed how it may be the case that “African Americans are unaware of early detection methods for prostate cancer (e.g., PSA testing),” and experience “other barriers such as cost and transportation” as factors that may prevent African American men from being screened” (p. 315).

Role of Potential Factors

Mahal et al. (2014) discussed some of the multifactorial causes for the excess mortality among AA men; for example, AA men may have “a biologic predisposition for aggressive disease, have poorer access to care, experience treatment delays, and/or

receive care from lower volume and quality centers, all of which could lead to worse survival after a median follow-up of only 39 months" (p. 388).

Wu and Modlin (2012) cited potential contributory factors, such as the possibility that "African Americans receive less screening," experience "poor communication" with physicians, and are impacted by a "lack of cultural competency among physicians" (p. 315). They also cited a "lack of health insurance (and poor access to quality care as a result), and deficiency of knowledge about screening" (p. 315).

Hoffman et al. (2001) noted that socioeconomic "factors have been hypothesized to explain the racial and ethnic differences in the stage of prostate cancer at diagnosis" (p. 391). According to Hoffman et al., "African-Americans, who are disproportionately represented in the lower socioeconomic levels, are believed to have less access to health care and preventive services than non-Hispanic whites" (p. 391). They also reported how "insurance status and employment status were associated with the risk for presenting with advanced disease" (p. 391). Also mentioned was the reality that "socioeconomic factors alone cannot adequately explain the higher percentage of advanced disease in African-Americans" (p. 391).

Fowke et al. (2005) also discussed risk factors for being diagnosed with advanced prostate cancer. These factors included men "living in low-income and low-education census tracts, men without health insurance, or men with publicly funded insurance" (p. 334).

Hoffman et al. (2001) also noted many factors. These included the role of potential "racial differences in tumor biology, possibly attributable to differences in dietary, hormonal, or molecular factors," which may "lead to more aggressive tumors" (p. 388).

Wu and Modlin (2012) also discussed the potential role of "nutritional factors" that may "also contribute partly to prostate carcinogenesis" (p. 317). There are also potential culture-specific and "race-specific differences in diet" that may "play an important role in prostate cancer risk" (p.317). For example, obesity **"**has been shown to increase the risk

of more-aggressive prostate cancer, but not of less-aggressive tumors" (p. 317). Also, for African American men, obesity appear to be a significant risk factor, given that obesity "was found to be associated with shorter biochemical relapse-free survival" in African American men; yet, on the other hand, obesity "was not an independent risk factor in white men" (p. 317). This suggests how "healthy lifestyles" can play a role in the "reduction in risk for prostate cancer"; they also suggested relevant benefits from "a low-fat diet, a healthy body mass index, and daily exercise" (p. 318).

Health Care Disparities and Treatment Factors

Wu and Modlin (2012) noted how "the 2002 Institute of Medicine report, Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care, found evidence that racial and ethnic minorities tend to receive lower-quality health care than whites" (pp. 313-314). Wu and Modlin found more "favorable survival outcomes for African Americans with localized disease may be achieved with uniform assignment of treatment" (p. 316). Wu and Modlin reported how "survival outcomes were equivalent between whites and blacks when treatment was assigned in a uniform manner without regard to race" (p. 315). They discussed the manner in which "data suggest that if localized prostate cancer is treated adequately and appropriately, African American patients may have improved survival rates" (p. 317).

Wu and Modlin (2012) also noted how there are research studies that "have also determined that there "are apparent differences "in the treatments offered to patients, which in turn negatively affect survival" (p. 316). The treatments highlighted were "potentially curative local therapies (including radical surgery or radiation)" that "may be recommended less often to black men because of major comorbidities or socioeconomic considerations" (p. 316).

Mahal et al. (2014) examined trends in disparate treatment of African American (AA) men with localized prostate cancer (PCa) across National Comprehensive Center Network (NCCN) risk groups in the United States. According to Mahal et al., it has been reported that "African American (AA) men have a significantly higher risk of dying from PCa than white men" (p. 386). In addition, it is generally "unknown how much of this is due to differences in biology vs disparities in treatment patterns and access to care" (p. 386).

Regarding prostate cancer (PCa) and guidelines established by the National Comprehensive Cancer Network (NCCN), Mahal et al. (2014) further reported that "there is a paucity of literature that examines racial disparities in PCa by NCCN risk groups, and evidence is conflicting as to whether racial disparities in the use of definitive treatment change with more advanced disease" (p. 386). Mahal et al. also indicated that "AA patients were significantly less likely to receive curative-intent treatment" relative to "white men among patients with intermediate- to high-risk PCa" (p. 387).

Mahal et al. (2014) investigated prostate cancer-specific mortality (PCSM). They found "after a median follow-up of 39 months, cumulative incidence estimates of PCSM were significantly higher for AA men compared with white men among patients with intermediate- to high-risk disease, with 5-year PCSM rates of 4.5% (95% CI, 4.1%-4.9%) for AA men" (p. 388). Mahal et al. indicated that statically "multivariate competing-risks regression analysis revealed an increased risk" for prostate cancer specific mortality (PCSM) "among AA men compared with white men, with a hazard ratio of 1.12 (95% CI, 1.01-125; p=.03)" (p. 388). Mahal et al. also reported that "men with intermediate- to high-risk PCa are at a 12% increased relative risk for PCSM compared with white men" (p. 388). Yet, "AA men receive curative-intent treatment 18% less often relative to white men" (p. 388). Mahal et al. further indicated that this "disparity is even greater among high-risk patients as AA men with high-risk disease were 40% less likely to receive curative treatment compared with white patients" (p. 388).

Mullins et al. (2010) also indicated that "AA men tend to be less informed of their options compared with Whites, and therefore may not seek aggressive treatment options for clinically localized PC" (p. 566). Furthermore, Mullins et al. reported how "AA men with locally advanced PC are less likely to undergo radical prostatectomy than their White counter-parts" (p. 566).

As per Mullins et al. (2010), "potential causes of the observed disparities in staging" may "include physician bias against staging" the prostate cancer of African American men, as well as the elderly—whether "intentional or unintentional" (p. 572). Further, additional potential causes may include "health system factors or a lack of staging facilities at hospitals where many AA or elderly seek care, a lack of effective communication (lack of cultural competency)" (p. 572). Also, additional causes may include a "lack of delivery of informed consent provided to AA and elderly males by physicians to explain the importance and rationale for staging, lack of patient education about prostate cancer by physicians" (p. 572). In addition, other causes may involve a "lack of health literacy on the part of AA or elderly patients, leading to lack in understanding the importance of staging, socioeconomic determinant factors (i.e., lack of transportation, difficulty getting off work, etc.), or patient behavioral factors" (p. 572).

Underwood et al. (2004) evaluated data (N=142,340) from 1992 and 1999 with White, Black, and Hispanic men and identified racial/ethical disparities in the treatment of localized/regional prostate cancer. Underwood et al. found that compared "to white American men black American men are at greater risk for this cancer and they experience greater mortality" (p. 1504). Underwood et al. offered the following:

> Although the higher mortality in black men may be secondary to inherent genetic differences, as demonstrated by higher tumor grade and stage at presentation, disparities in the use of definitive therapy may also contribute to the observed disparity in mortality. (p. 1504)

Underwood et al. (2004) further explained how Black men "were most likely to receive definitive therapy (radical prostatectomy or external beam radiation) when

diagnosed with localized prostate cancer" (p. 1505). They also went on to report on the "most rapidly growing ethnic group in the United States" (p. 1506), i.e., Hispanics. For this group of Hispanic men, Underwood et al. reported a "75% increase in incident prostate cancer cases between 1969 and 1991" (p. 1504). Furthermore, "more disturbing was the observation that while age adjusted mortality between 1983 and 1991 decreased in non-Hispanic men, it remained stable in Hispanic men" (p. 1504). They noted how "treatment patterns in the Hispanic American population have been less well characterized" (p. 1504).

Underwood et al. (2004) continued to explain that Black men as compared to Hispanic men experienced the "lowest odds of receiving definitive therapy" (p. 1506). This is noteworthy since "higher grade prostate cancers results in greater cancer specific mortality in a 10 to 15-year period in men who do not receive definitive treatment" (p. 1506).

Underwood et al. (2004) emphasized that "a combination of biological and sociological factors contribute to the racial/ethnic disparity in prostate cancer mortality and our finding is just one of many potential nonbiological mechanisms" (p. 1506). Underwood et al. emphasized how "racial/ethnic disparities in the use of definitive treatment were observed" for African American and Hispanic men when compared to "white men throughout the 1990s" (p. 1507).

The Contemporary PSA Controversy

There has also been controversy around the PSA test. For example, Barry (2009) has noted that there are high risks of overdiagnosis and overtreatment associated with PSA screening. Barry reported on the "first reports from two large, randomized trials that many observers hoped would settle the controversy" (p. 1351). More specifically, the U.S. Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial reported no

mortality benefit from combined screening with PSA testing and digital rectal examination "during a median follow-up of 11 years" (p. 1352). On the other hand, the European Randomized Study of Screening for Prostate Cancer (ERSPC) trial reported that "PSA screening without digital rectal examination was associated with a 20% relative reduction in the death rate from prostate cancer as a median follow-up of 9 years, with an absolute reduction of about 7 prostate cancer deaths per 10,000 men screened" (p. 1352). Further, "ongoing results from both of these trials may necessitate rethinking the role of digital rectal examination in cancer screening"(p. 1353). Meanwhile, Barry has emphasized that there are high risks of overdiagnosis and overtreatment associated with PSA screening. Barry elaborated:

> After digesting these reports, where do we stand regarding the PSA controversy? Serial PSA screening has at best a modest effect on prostate-cancer mortality during the first decade of follow-up. This benefit comes at the cost of substantial overdiagnosis and overtreatment. It is important to remember that the key question is not whether PSA screening is effective but whether it does more good than harm. (p. 1353)

Similarly, McNaughton-Collins and Barry (2011) posed a key question: "Who should decide about screening for prostate cancer: expert panels of clinicians and methodologists, primary care clinicians, specialists, or fully informed patients themselves?" (p. 1951).

The Controversy and Resultant Varied Recommendations to Date

The U.S. Preventive Services Task Force

Further, the U.S. Preventive Services Task Force (Moyer, 2012) provided recommendations, as an independent panel of experts in primary care and prevention. The USPSTF (Moyer, 2012) reported as follows:

> The USPSTF recommends against prostate-specific antigen (PSA)–based screening for prostate cancer (grade D recommendation)….

> Contemporary recommendations for prostate cancer screening all incorporate the measurement of serum PSA levels; other methods of detection, such as digital rectal examination or ultrasonography, may be included. There is convincing evidence that PSA-based screening programs result in the detection of many cases of asymptomatic prostate cancer. There is also convincing evidence that a substantial percentage of men who have asymptomatic cancer detected by PSA screening have a tumor that either will not progress or will progress so slowly that it would have remained asymptomatic for the man's lifetime. The terms "overdiagnosis" or "pseudo-disease" are used to describe both situations…. (p. 12)

The USPSTF further elaborated on their recommendation:

> Although the USPSTF discourages the use of screening tests for which the benefits do not outweigh the harms in the target population, it recognizes the common use of PSA screening in practice today and understands that some men will continue to request screening and some physicians will continue to offer it. The decision to initiate or continue PSA screening should reflect an explicit understanding of the possible benefits and harms and respect the patients' preferences. Physicians should not offer or order PSA screening unless they are prepared to engage in shared decision making that enables an informed choice by the patients. Similarly, patients requesting PSA screening should be provided with the opportunity to make in- formed choices to be screened that reflect their values about specific benefits and harms. Community- and employer-based screening should be discontinued. (p. 122)

Also acknowledged by Moyer (2012) were the recommendations of other major groups, as follows:

> The American Urological Association recommends that PSA screening, in conjunction with a digital rectal examination, should be offered to asymptomatic men aged 40 years or older who wish to be screened, if estimated life expectancy is greater than 10 years…. It is currently updating this guideline…. The American Cancer Society emphasizes informed decision making for prostate cancer screening: Men at average risk should receive information beginning at age 50 years, and black men or men with a family history of prostate cancer should receive information at age 45 years…. The American College of Preventive Medicine recommends that clinicians discuss the potential benefits and harms of PSA screening with men aged 50 years or older, consider their patients' preferences, and individualize screening decisions…. The American Academy of Family Physicians is in the process of updating its guideline, and the American College of Physicians is currently developing a guidance statement on this topic. (p. 132)

American Urological Association

On the other hand, guidelines approved by the American Urology Association (AUA) board of directors in April of 2013 were published by Carter et al. (2013). This involved the AUA commissioning an independent group to conduct a systematic review and meta-analysis of the available published literature, covering prostate cancer detection and screening. The guidelines appear below, as per Carter et al.:

> GUIDELINE STATEMENTS
>
> 1. The Panel recommends against PSA screening in men under age 40 years. (*Recommendation*; Evidence Strength Grade C)
>
> In this age group there is a low prevalence of clinically detectable prostate cancer, no evidence demonstrating benefit of screening and likely the same harms of screening as in other age groups.
>
> 2. The Panel does not recommend routine screening in men between ages 40 to 54 years at average risk. (*Recommendation;* Evidence Strength Grade C)
>
> For men younger than age 55 years at higher risk (e.g. positive family history or African American race), decisions regarding prostate cancer screening should be individualized.
>
> 3. For men ages 55 to 69 years the Panel recognizes that the decision to undergo PSA screening involves weighing the benefits of preventing prostate cancer mortality in 1 man for every 1,000 men screened over a decade against the known potential harms associated with screening and treatment. For this reason, the Panel strongly recommends shared decision-making for men age 55 to 69 years that are considering PSA screening, and proceeding based on a man's values and preferences. (*Standard;* Evidence Strength Grade B)
>
> The greatest benefit of screening appears to be in men ages 55 to 69 years.
>
> 4. To reduce the harms of screening, a routine screening interval of two years or more may be preferred over annual screening in those men who have participated in shared decision-making and decided on screening. As compared to annual screening, it is expected that screening intervals of two years preserve the majority of the benefits and reduce overdiagnosis and false positives. (*Option;* Evidence Strength Grade C)
>
> Additionally, intervals for rescreening can be individualized by a baseline PSA level.

> 5. The Panel does not recommend routine PSA screening in men age 70+ years or any man with less than a 10 to 15 year life expectancy. (*Recommendation;* Evidence Strength Grade C)
>
> Some men age 70+ years who are in excellent health may benefit from prostate cancer screening. (pp. 1-2)

The American Cancer Society

The American Cancer Society (2014) has offered the following recommendations for the early detection of prostate cancer:

> The American Cancer Society (ACS) recommends that men have a chance to make an informed decision with their health care provider about whether to be screened for prostate cancer. The decision should be made after getting information about the uncertainties, risks, and potential benefits of prostate cancer screening. Men should not be screened unless they have received this information.
>
> The discussion about screening should take place at age 50 for men who are at average risk of prostate cancer and are expected to live at least 10 more years.
>
> This discussion should take place starting at age 45 for men at high risk of developing prostate cancer. This includes African Americans and men who have a first-degree relative (father, brother, or son) diagnosed with prostate cancer at an early age (younger than age 65).
>
> This discussion should take place at age 40 for men at even higher risk (those with more than one first-degree relative who had prostate cancer at an early age).
>
> After this discussion, those men who want to be screened should be tested with the prostate-specific antigen (PSA) blood test. The digital rectal exam (DRE) may also be done as a part of screening.
>
> If, after this discussion, a man is unable to decide if testing is right for him, the screening decision can be made by the health care provider, who should take into account the patient's general health preferences and values.
>
> Assuming no prostate cancer is found as a result of screening, the time between future screenings depends on the results of the PSA blood test:
>
> -Men who choose to be tested who have a PSA of less than 2.5 ng/ml, may only need to be retested every 2 years.

-Screening should be done yearly for men whose PSA level is 2.5 ng/ml or higher.

Because prostate cancer often grows slowly, men without symptoms of prostate cancer who do not have a 10-year life expectancy should not be offered testing since they are not likely to benefit. Overall health status, and not age alone, is important when making decisions about screening.

Even after a decision about testing has been made, the discussion about the pros and cons of testing should be repeated as new information about the benefits and risks of testing becomes available. Further discussions are also needed to take into account changes in the patient's health, values, and preferences. (paras. 1-9)

Memorial Sloan Kettering Cancer Center

The Memorial Sloan Kettering Cancer Center (2014) has offered the following recommendations, in contrast, while recognizing a role for both the PSA and digital rectal examination (DRE):

Prostate-Specific Antigen (PSA) Test

This blood test measures levels of prostate-specific antigen, a protein made by cells of the prostate gland. Although it is normal for men to have low levels of PSA in their blood, prostate cancer can increase a man's PSA levels. Men with an elevated PSA level (greater than or equal to 3 ng/mL) or a rising value over time may be referred for a biopsy.

However, an elevated or rising PSA level alone does not always mean that a man has prostate cancer. PSA levels also increase with age, and may be higher in men with a common, noncancerous condition called benign prostatic hyperplasia (BPH), or with a condition called prostatitis, an inflammation of the gland.

Digital Rectal Examination (DRE)

In this detection test, the doctor inserts a gloved finger into the rectum to feel for swelling or inflammation of the prostate or other abnormalities such a hardness or nodule that might suggest the presence of cancer.

Prostate Cancer Screening Guidelines at Memorial Sloan Kettering

Doctors at Memorial Sloan Kettering recommend that all men get their first PSA test at age 45. For those with a family history of the disease, and for African American men — who are at a significantly higher risk of developing prostate cancer than are Caucasian men — our recommendation

> is to have your first PSA test at age 40. The frequency of follow-up PSA testing and whether to have additional testing depend on the results of this test, as well as other factors including your age, whether there is a history of prostate cancer in your family, any future changes in PSA level, and your general health…
>
> **Getting the Right Diagnosis**
>
> A prostate that feels abnormal and an elevated PSA level are both possible indicators of prostate cancer, but neither test — alone or in combination — can provide a definitive diagnosis, which can only be established with a prostate biopsy…. (paras 2-5, 7)

Recommendations for Future Research

Hoffman et al. (2001) recommended that future research "be directed at the identification of biologic markers and genetic susceptibility factors, as well as additional socioeconomic factors, including use of health-care systems, distance from health care, diet, literacy, and health beliefs" (p. 394). On the other hand, Fowke et al. (2005) suggested that the assessment "of relationships between prostate cancer screening and social support structures, self-efficacy to make health care decisions, and individual perceptions of health and disease might help address these issues" (p. 339).

Statement of the Problem

The problem that this study addresses is the need to increase awareness among African American men regarding their potential risk of prostate cancer (Hoffman et al., 2001) and the health disparities (Mullins et al., 2010; Wu & Modlin, 2012) characterizing their group, as well as foster discussion with doctors about their family history of prostate cancer and whether they should pursue prostate cancer screening—meaning involvement in the "prostate specific antigen (PSA) test and digital rectal examination (DRE)," which "enable the detection of early-stage and organ-confined disease among otherwise asymptomatic men" (Fowke et al., 2005, p. 333). There is also a need to increase

awareness of treatment options to compensate for a lack of physician education on the topic (Mullins et al., 2010). Further, there is a need for innovative approaches to health education. For example, there is the need to evaluate the feasibility of positively impacting decisions to discuss prostate cancer screening with one's physician through the use of e-health tailored to be culturally appropriate; and, also positively impact knowledge of prostate cancer treatment options (Misra & Wallace, 2012)—i.e., using avatar videos (cartoon-like). In addition, it is important to asses the extent to which those exposed to the avatar videos intend to recommend them to other African American men, as they may engage in the diffusion of the innovation (Rogers, 1962, 1995) of e-health on prostate cancer. African American men so informed via e-health may be able to share the video with any men in their social networks regarding prostate cancer.

Purpose of the Study and Objectives

The purpose of this study is to develop and evaluate an innovative online e-health avatar video (cartoon-like) tailored to be culturally appropriate for African American men—as a potentially viable approach to fostering patient discussions with their physicians about prostate cancer screening. In addition, the main purpose of the study is to identify significant predictors of African American men recommending the e-health video to other men.

Research Questions, Survey Parts, and Data Analysis Plan

Given a sample of African American men (N=41) who respond to a social marketing campaign (i.e., using e-mails, text messages, twitter, Facebook, flyers posted in community venues) and complete a survey, including watching an avatar video, this study answers the following research questions:

Quantitative Portion of Study

1. What are their demographic and background characteristics (e.g., age, socioeconomic status, level of education)?
   PART I: BASIC DEMOGRAPHICS (BD-9)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

2. What is their health status (e.g., Body Mass Index) and how do they rate their healthcare?
   PART II: BRIEF HEALTH SURVEY (BHS-8)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

3. What is the prevalence of diagnoses of prostate cancer, history of screening for prostate cancer, as well as the prevalence of prostate cancer in their family and in their social network—including deaths from prostate cancer and the metastasis of cancer?
   PART II: PROSTATE CANCER SCALE (PCS-10)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

4. What is their health literacy, as measured in terms of relevant skills and self-efficacy to perform them?
   PART III: SCALE MEASURING HEALTH LITERACY VIA SKILLS AND SELF-EFFICACY (SM-HL-V-S-SE-16)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

5. What is their stage of change and self-efficacy for (1) going to see a medical provider and getting a physical examination at least once a year,
   (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, and (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer?
   PART V: PROSTATE CANCER SCREENING EMPOWERMENT SCALE MEASURING STAGE OF CHANGE AND SELF-EFFICACY FOR FOUR BEHAVIORS—PRE-VIDEO (PCS-ES-M-SOC-SE-PRE-V-4)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

6. After watching an avatar (cartoon-like) video, what do they report as their dose of exposure to the video (i.e., watched none, some, most, or all of the video)?
   PART VI: DOSE OF EXPOSURE TO VIDEO (DOE-TV-1)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

7. How do they evaluate or rate the video in terms of the information shared?
   PART VII: RATE THE VIDEO (RTV-1)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

8. After watching the video, what is their stage of change and self-efficacy for (1) going to see a medical provider and getting a physical examination at least once a year, (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening?
   PART VIII: PROSTATE CANCER SCREENING EMPOWERMENT SCALE MEASURING STAGE OF CHANGE AND SELF-EFFICACY FOR FOUR BEHAVIORS—POST-VIDEO (PCS-ES-M-SOC-SE-POST-V-4)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

9. Did they move across stages of change from precontemplation or contemplation to preparation for any of the four target behaviors (i.e., (1) going to see a medical provider and getting a physical examination at least once a year, (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening?
   Data Analysis Plan: Inferential statistics, specifically paired t-tests, comparing their pre-video viewing (PART V) to post-video viewing scores (PART VIII)

10. Did they experience an increase in self-efficacy or confidence to perform the four target behaviors from (i.e., (1) going to see a medical provider and getting a physical examination at least once a year, (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening) from before to after watching the videos?
    Data Analysis Plan: Inferential statistics, specifically paired t-tests, comparing their pre-video viewing (PART V) to post-video viewing scores (PART VIII)

11. Is there a significant relationship between selected demographics and other study scales with the study outcome variable/dependent variable of being in an action or maintenance stage for [# (3)] making sure they receive a PSA test to screen for prostate cancer—as measured before watching the video?
    Data Analysis Plan: Inferential statistics, specifically Spearman correlations

12. What are the significant predictors of being in an action or maintenance stage for [# (3)] making sure they receive a PSA test to screen for prostate cancer—as measured before watching the video?
Data Analysis Plan: Multiple regression and backward stepwise regression analyses.

Mixed Methods Portion of Study

13. To what extent do they intend to diffuse the innovation of providing health education on prostate cancer via e-health in the form of an avatar video by either recommending or not recommending the video? And, what are their reasons for recommending or not recommending the avatar video, including any other comments they might have?
PART IX: INTENTION TO ENGAGE IN DIFFUSION OF THE INNOVATION OF WATCHING THE AVATAR VIDEO (DIWV-2)
Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages; and, the identification of emergent themes for the qualitative data

Anticipated Findings from Data Analysis

It was anticipated that the significant predictors of being in an action or maintenance stage for [# (3)] making sure they receive a PSA test to screen for prostate cancer—as measured before watching the video—would be the following independent variables:

- Higher level of education
- Higher socioeconomic status
- Lower Body Mass Index (BMI)
- Higher health literacy skills and self-efficacy
- Higher pre-video viewing self-efficacy for (1) going to see a medical provider and getting a physical examination at least once a year, (2) making sure they receive a digital rectal examination to screen for prostate cancer, (3) making sure they receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening

Rationale for the Study

Regarding prostate cancer, Mullins et al. (2010) identified a lack "of awareness of treatment options and lack of patient education by physicians" (p. 566). Thus, there is a rationale for increasing awareness around prostate cancer.

Also, there is a rationale for investigating the prevalence of diagnoses of prostate cancer, history of screening for prostate cancer, as well as the prevalence of prostate cancer in their family and in their social network—including deaths from prostate cancer and the metastasis of cancer. Indeed, the rationale for this investigation is multifaceted, involving how African American/Black men have the following, with regard to prostate cancer (PC):

- the world's highest incidence of PC (Hoffman et al., 2001);
- been reported to experience a PC incidence two-thirds higher than Whites (Wu & Modlin, 2012);
- been found to possess a lack of awareness of treatment options and suffer from a lack of education by physicians, resulting in lack of access to health care, as well as lower likelihood of seeking aggressive treatment options for localized PC (Mullins et al., 2010);
- higher incidence of PC, and a higher mortality from PC, and present with a more aggressive PC—relative to European American men (Mullins et al., 2010);
- a lower likelihood of receiving more expensive or innovative treatment (Mullins et al., 2010);
- the lowest odds of receiving definitive therapy for prostate cancer—including the risk of developing higher grade prostate cancers and greater cancer specific mortality (Underwood et al., 2004);

- a pattern of being less likely to undergo radical prostatectomy compared to their White counterparts (Mullins et al., 2010);
- a risk of increased metastasis as a result of inaccurate staging, or a tendency for the PC not to be staged, or suffer from physicians failing to provide education on the importance of staging PC (Mullins et al., 2010);
- a pattern of presenting with more advanced prostate cancer disease with a poorer prognosis (Mullins et al., 2010);
- a shorter disease-free survival period relative to other racial groups (Mullins et al., 2010);
- suffer racial/ethnic disparities in prostate cancer mortality (Underwood et al., 2004)—specifically, a mortality rate twice as high as that of White men (Wu & Modlin, 2012).

Also noteworthy is how equivalent survival outcomes have been realized when Black and Whites had treatment assigned "in a uniform manner without regard to race" (Wu & Modlin, 2012, p. 315). This further underscores the likely role of disparities in health care service delivery.

One way to address disparities in health care service delivery is to empower African American men so they have a sufficiently high level of self-efficacy to be able to perform the four target behaviors: (1) going to see a medical provider and getting a physical examination at least once a year; (2) making sure they receive a digital rectal examination to screen for prostate cancer; (3) making sure they receive a PSA test to screen for prostate cancer; and, (4) spreading awareness among other African American men about the need for prostate cancer screening—so they, too, can seek out prostate cancer screening. Thus, there is a rationale for this study investigating men's stage of change (i.e., theory of Prochaska & DiClemente, 1983) and self-efficacy (i.e., theory of Bandura, 1977, 1997) for performing these four target behaviors—first, before watching an online e-health avatar (cartoon-like) video, and, second, after watching the video.

The rationale for developing and evaluating the online e-health avatar video on prostate cancer follows from numerous previous studies conducted by fellows of the Research Group on Disparities in Health (RGDH) of Teachers College, Columbia University that have found that such a video can serve as a brief intervention (Aiyedun, 2014; Chung, 2013; Garcia, 2013; Renne, 2013). Such studies have typically found evidence that an online avatar video can foster significant movement across stages of change (e.g., precontemplation to contemplation stage), as well as increases in self-efficacy for performing behaviors of focus in the video. These studies have all followed the work of Misra and Wallace (2012) in seeking to create e-health that is tailored to be culturally appropriate for the category of consumers of focus. The present study continues in that tradition of research conducted by fellows of the RGDH through the sponsorship of Professor Barbara Wallace, Director of the RGDH, while specifically tailoring e-health for African American men considered at high risk for prostate cancer—as indicated by Hoffman et al. (2001).

It also follows, logically, that there is value in determining dose of exposure to the video (i.e., watched none, some, most, or all of the video). Dose of exposure may be a factor related to how the participants evaluate and rate the videos. Further, of interest is whether the participants' intend to recommend the video to others, or engage in diffusion of the innovation (Rogers, 1962, 1995) of e-health on prostate cancer. Reasons for either recommending or not recommending the e-health avatar video, as well as other comments offered, also allowed the study men to express themselves freely, while qualitative data analysis will identified emergent themes.

At the same time, there is a rationale for investigating potential underlying causal mechanisms or varied factors potentially operating. More specifically, there is a rationale for investigating demographic and background characteristics, including age, socioeconomic status, level of education, Body Mass Index (BMI)—as well as health

insurance and ratings of their health status and health care; and, ratings of their health care providers for their cultural sensitivity and cultural competence.

Research has shown that potential factors are numerous. For example, they may be socioeconomic, biological, receipt of lower quality health care, a lack of cultural competency among physicians, deficiencies in nutritional intake—which can contribute to prostate carcinogenesis, as well as obesity and a lack of a healthy lifestyle (Wu & Modlin, 2012).

There is also a rationale for investigating level of health literacy, while operationalizing this as per the definition provided by the CDC (2014a). The CDC has defined health literacy, as follows: "The Patient Protection and Affordable Care Act of 2010, Title V, defines health literacy as the degree to which an individual has the capacity to obtain, communicate, process, and understand basic health information and services to make appropriate health decisions" (para. 1). Also, Mullins et al. (2010) identified a lack of health literacy as a potential factor in prostate cancer health disparities.

Other studies have selected as the study outcome variable/dependent variable being in an action or maintenance stage for the target behavior of interest (e.g. Garcia, 2013). Thus, there is a rationale for this study selecting the study outcome variable/dependent variable of being in an action or maintenance stage for [# (3)] making sure they receive a PSA test to screen for prostate cancer—as measured before watching the video. This study outcome variable/dependent variable permits the investigation of whether selected demographic and other study scales are significantly related, and exploring independent variables that may significantly predict it.

Finally, there is a rationale for the study's theoretical framework, given prior similar research studies (e.g., Aiyedun, 2014; Chung, 2013; Garcia, 2013; Renne, 2013). This framework includes the following: the stages of change from the transtheoretical model brought forth by Prochaska and DiClemente (1983); the self-efficacy theory

advanced by Bandura (1977, 1997); and, the diffusion of innovation theory as per the work of Rogers (1962, 1995).

Definition of Terms and Abbreviations

The following terms and abbreviations have definitions, as follows:

- BCL2 Gene: “A protein that helps control whether a cell lives or dies by blocking a type of cell death called apoptosis” (National Institute of Health (NIH), 2017a).
- Biological Predisposition: “Also known as genetic predisposition, is an increased likelihood of developing a particular disease based on a person’s genetic makeup” (NIH, 2017b).
- Cause-specific: “Death rate are deaths assigned to a specific cause during a given time interval” (CDC, 2014b).
- Chromosome 8: “Humans normally have 46 chromosomes in each cell, divided into 23 pairs. Chromosome 8 spans more than 146 million DNA building blocks (base pairs) and represents between 4.5 and 5 percent of the total DNA in cells” (NIH, 2017c).
- Chromosome 8q24: “Chromosome 8q24 is associated with increase cancer incidence. See definitions chromosome 8 and q24” (NIH, 2017c).
- EphB2 Gene: “This gene encodes a member of the Eph receptor family of receptor tyrosine kinase transmembrane glycoproteins” (NIH, 2017d).
- Genetic variants: “An alteration in the most common DNA nucleotide sequence. The term variant can be used to describe an alteration that may be benign, pathogenic, or of unknown significance. The term variant is increasingly being used in place of the term mutation” (NIH, 2017e).

- Gleason score: “A system of grading prostate cancer tissue based on how it looks under a microscope. Gleason scores range from 2 to 10 and indicate how likely it is that a tumor will spread. A low Gleason score means the cancer tissue is similar to normal prostate tissue and the tumor is less likely to spread; a high Gleason score means the cancer tissue is very different from normal and the tumor is more likely to spread” (NIH, 2017f).
- Health Disparities: “The Department of Health and Human Services (HHS) defines health disparities as differences in health outcomes that are closely linked with social, economic, and environmental disadvantage and are often driven by the social conditions in which individuals live, learn, work, and play” (NIH, 2017g).
- Intermediate to high risk cancer: “In terms of being at risk for prostate cancer, intermediate risk can be viewed as having a PSA test result between 10 and 20, a Gleason score of 7, or a clinical stage that is T2b. High risk can be viewed as having a PSA test result greater than 20, a Gleason score of 8 to 10, or a clinical stage that is T2c to T3c” (Prostate Cancer Risk Group, 2014).
- Prostate cancer (PCa or PC): “Cancer that forms in tissues of the prostate (a gland in the male reproductive system found below the bladder and in front of the rectum). Prostate cancer usually occurs in older men” (NIH, 2017h).
- Prostate Cancer Specific Mortality (PCSM): This is the cause-specific mortality rate measurement of a prostate cancer population; see mortality rate and cause specific mortality.
- Mortality rate: “A mortality rate is a measure of the frequency of occurrence of death in a defined population during a specified interval” (CDC, 2012b).
- Prostate Summary Analysis (PSA): “A protein made by the prostate gland and found in the blood. PSA blood levels may be higher than normal in men who have prostate cancer, benign prostatic hyperplasia (BPH), or infection or

inflammation of the prostate gland. Also called prostate-specific antigen" (NIH, 2017i).

- q24: "Translocations between chromosome 8 and other chromosomes have been associated with other types of cancer. This translocation leads to continuous cell division without control or order, which likely contributes to the development of Burkitt lymphoma" (NIH, 2017c).
- Tumor suppression genes: "A type of gene that makes a protein called a tumor suppressor protein that helps control cell growth. Mutations (changes in DNA) in tumor suppressor genes may lead to cancer. Also called antioncogene" (NIH, 2017j).

Delimitations

The study was delimited to AA men ages 18 and above who complete the study survey, including reporting watching and rating the avatar video.

Limitations

Limitations for this study include the following: the use of self-report data that are not validated, including the risk of participants providing potentially socially desirable responses—as no measure of social desirability is being used in this study; the manner in which study subjects need to have access to computers and the internet to complete the study; the potential burden of time on study participants' given study task—even as the Principal Investigator has attempted to limit the length of study participation; and the difficulty of engaging a stigmatized, hard-to-reach population of African American men at risk for prostate cancer, which may potentially limit the sample size. Finally, the study

used a sample of convenience that limits generalizability, as well as volunteers who may have certain characteristics (e.g., greater interest in prostate cancer).

Conclusion

This chapter has served to introduce the study. Subsequent chapters of the dissertation provides a literature review (Chapter II), study methods (Chapter III), results of data analysis (Chapter IV), and discussion of results with implications and conclusions (Chapter V).

Chapter II

LITERATURE REVIEW

This chapter reviews literature relevant to the dissertation topic. The chapter covers the following issues: (1) epidemiology of prostate cancer in the United States, with emphasis on health disparity issues among African Americans; (2) factors related to prostate cancer's prevalence, morbidity, and mortality; (3) research on the symptoms of prostate cancer; (4) research on screening methods; (5) treatment of prostate cancer; (6) interventions to increase awareness, screening, and adherence to treatment recommendations; (7) research on e-health; and (8) theories guiding this study.

Epidemiology of Prostate Cancer in the United States and Health Disparities in Prevalence, Morbidity, and Mortality Suffered by African Americans

> African American men suffer the highest prostate cancer incidence and mortality rates among men of all racial and ethnic backgrounds in the United States [1]. This racial disparity is the largest for any major cancer and all African American men are deemed to be at high-risk for prostate cancer. The United States Senate passed a resolution in 2012 recognizing prostate cancer among African American men to be of epidemic proportions [2]. (Jarrett, 2013)

Researchers concur, as Holmes et al. (2012) wrote: "Prostate cancer (PC) is the most common malignancy in men and the second leading cause of cancer death" (p. 883). "In 2011," they reported, "more than 240,000 men were diagnosed with prostate cancer in the United States, of whom 33,000 died of the disease" (p. 883). Likewise, Crawford et al. (2014) stated that "prostate cancer is the most frequently diagnosed cancer and the

second leading cause of cancer related death in men, with an estimated 238,590 new cases and 29,720 deaths in the United States during 2013" (p. 664). Similarly, Myers et al. (2010) wrote: "In 2010, there were an estimated 217,730 new cases of prostate cancer in the United States, and 32,050 deaths from the disease, making it the second leading cause of cancer-related death among men" (p. 240).

Holmes at al. (2010) further noted that "black men are more likely to be diagnosed with advanced prostate cancer (high risk, locally advanced or metastatic disease) and more likely to die of this disease" (p. 884), and that "racial disparities in prostate cancer diagnosis and survival are well documented" (p. 883). Black patients in the U.S., they emphasized, are diagnosed with prostate cancer at a higher incidence and a younger age and with more advanced disease. In the same regard, Powell et al. (2010) reported the results of large Detroit study in which, they stated, "the age specific incidence rate of distant PCa/100,000 men was approximately 4 times greater in AAM [African American men] than in EAM [European American men] for all age groups" (p. 1794).

Earlier researchers, too, noted the same basic findings in relation to overall prostate cancer incidence and mortality in the U.S., as well as its relatively higher incidence among African American men. For example, Freedman et al. (2006) reported that "prostate cancer is the most common noncutaneous malignancy among U.S. men, with an estimated 234,460 new cases and 27,350 deaths in 2006" (p. 14068), and the highlighted the fact that "African Americans have the highest incidence of prostate cancer in the United States" (p. 14068). Likewise, Salami, Etukakpan, and Olapade-Olaopa (2007) observed: "The highest incidence of CaP worldwide has been recorded in black men and African-American men (AAM) are twice as likely as Caucasian Americans to die from the disease" (p. 456). Salami et al. also reported that AAMs "are also more likely to present at a younger age with more advanced disease and have historically had a poorer prognosis" (p. 456). Moreover, Salami et al. noted that "AAM with newly diagnosed CaP have higher PSA values than white men at initial diagnosis and in all stages, grades, and

age categories of the study population" (p. 458), and added: "Black men throughout the world have a higher rate of the disease than other ethnic groups" (p. 456).

As a consequence of this well-known and well-documented disparity, Knight (2014) reported that the American Cancer Society suggests "testing at younger ages for men at higher than average risk, including African American men" (p. 258). Myers (2011) noted that: "A recent report using data from the National Cancer Institute's Surveillance, Epidemiology, and End Results program is consistent with this view" (p. 240).

Factors Related to Prostate Cancer's Prevalence, Morbidity, and Mortality

Why do African American men experience a higher rate of prostate cancer, greater morbidity, and increased mortality from the disease than do White men? Existing research offers a range of answers.

For example, Heidenreich et al. (2011) reported: "The factors that determine the risk of developing clinical PCa are not well known, although three well-established risk factors have been identified: increasing age, ethnicity, and heredity" (p. 62). They also reported: "If one first-line relative has the disease, the risk is at least doubled" (p. 62), and that, "if two or more first-line relatives are affected, the risk increases 5- to 11-fold.… About 9% of individuals with PCa have true hereditary PCa, defined as three or more relatives affected or at least two who have developed early onset disease" (p. 62).

Freedman et al. (2006) conducted a study to "explore how much of the increased incidence of prostate cancer in African-American men might be explained by African (as compared with European) ancestry at 8q24" (p. 14070). To determine this, they studied 1,597 prostate cancer cases and 873 controls, and "evaluated the risk for individuals carrying zero, one, and two chromosomes with African ancestry" at the 8q24 locus.

(p. 14070). They concluded that "8q24 explains a large proportion of prostate cancer in younger African Americans" (p. 14071). Therefore, they stated:

> If it were possible to develop a treatment that reduced prostate cancer risk in the African-American population to the level that is seen in men who carry two copies of 8q24 inherited from recent European ancestors, the rate of prostate cancer would decrease by 49%. (p. 14070)

In addition, Freedman et al. (2006) noted that 8q24 increases significantly as men grow older. They wrote that this finding was "intriguing because it is known epidemiologically that the differential incidence of prostate cancer in African versus European Americans is greater at younger ages and is attenuated with older age" (p. 14071), and noted that "the specific variants causing increased risk for prostate cancer in African American because of 8q24 … remain to be identified" (p. 14071). Despite the fact that these variants remain to be identified, however, Freedman et al. were clear that the "results indicate … a formally significant association of prostate cancer to ordering by age" (p. 14069).

In a Detroit study they conducted, Powell et al. (2010) "found a highly significant association between CYP3A43 and high grade PCa in men younger than 60 years old" (p. 1795). "PCa volume in our patients with RP [radical prostatectomy] was greater in AAM than in EAM and the disease became distant disease at a ratio of 4 AAM to 1 EAM in the Detroit SEER population" (p. 1795). Powell et al. highlighted that "these findings support the concept that PCa grows more rapidly in AAM than in EAM and/or earlier transformation from latent to aggressive PCa occurs in AAM than in EAM" (p. 1795). In short, these authors concluded, "Multiple genetic and biological pathways contribute to more aggressive PCa, and increased cell proliferation and metastasis in AAM than in EAM" (p. 1794), which implies "a strong association between race and genotype" (p. 1795).

In 2007, Salami et al. wrote: "Many studies on molecular and cellular mechanisms suggest that black men have a genetic predisposition to the development and/or

progression of CaP" (p. 457), and reported that "abnormalities in enzymes regulating testosterone metabolism have also been implicated in increased CaP risk in black men" (p. 458). They elaborated: "Other molecular differences found in black men with CaP include a common mutation in EphB2, a gene on chromosome 1p, that has been associated with CaP risk in AAM with a family history of CaP" (p. 458), adding that "most clinical studies have shown that CaP is more aggressive in black than in white or Asian men leading to calls for efforts to detect the disease early in that sub-population" (p. 459). Heidenreich et al. (2011) underscored the importance of PSA, writing that "the level of PSA is a continuous parameter: The higher the value, the more likely the existence of PCa" (p. 63). Heidenreich et al. noted that "the finding that many men may harbour PCa, despite low levels of serum PSA, has been underscored by recent results from a US prevention study" (p. 63).

Salami et al. (2007) reported that "epidermal growth factor receptor (EGFR) gene and higher levels of expression of the wild-type EGFR protein have been detected in malignant prostatic tissues from black men" (p. 458), and noted that "[its most common mutant has] been shown to play a role in the initiation and progression of CaP, and both are now targets for specific anti-CaP strategies" (p. 458). In a study of prostate cancer in African American and Nigerian men, Salami et al. found that "invasive cancers were significantly higher in AAM than in Nigerian cases" (p. 458). Salami et al. also noted that "Jamaicans have an even higher incidence of CaP," and reported that a "recent study of CaP risk amongst men in the United Kingdom found that black men were three times more likely to be diagnosed with the disease than Caucasians" (p. 457). Moreover, Salami et al. noted: "Other studies have also found a higher prevalence of CaP in black men than in Caucasians (8.5% vs. 3.7%) in South Africa" (p. 457).

Salami et al. (2007) concluded: "The incidence figures above suggest that genetic factors play a major role in the observed racial differences in CaP phenotype" (p. 457), and added that "similar rates of CaP observed in black Caribbean and black African men

in the UK PROCESS Cohort study supports this assertion" (p. 457). Similarly, Powell et al. (2010) wrote: "We propose that a more rapid PCa growth rate and/or earlier transformation from latent to aggressive PCa in AAM than in EAM contribute significantly to the racial disparity of advanced disease at diagnosis and to the 2 to 3 times greater mortality rate in AAM than in EAM" (p. 1973).

Salami et al. (2007) also noted that the postoperative outcomes of Black men are less favorable, "as they have a higher rate of positive surgical margins, more instances of locally advanced CaP, and a greater percentage of cancers with a Gleason score of 8 or higher. Black ethnicity also appears to be an independent predictor of disease recurrence after adjusting for pretreatment indices of disease extent" (p. 457).

Although evidence of a genetic predisposition is widely accepted, non-genetic factors may also contribute to the higher incidence of prostate cancer, morbidity, and mortality among Black men, as Salami et al. (2007) noted:

> It is also of significance that, despite recent reports that black race is a predictor of detecting CaP at biopsy [50], both black native African men and AAM perceive 'barriers' to attending prostate-cancer screening clinics, particularly if this involves taking biopsy samples even when they are found to have elevated PSA levels. (p. 458)

On the other hand, Salami et al. (2007) considered it noteworthy that "these studies also found that black men had higher grade cancers, consumed a diet high in fat content, and had significantly higher Body Mass Indices (BMIs) than whites" (p. 459). As a result, they said that researchers "concluded that a high-fat diet and obesity are associated with progression of latent to clinically significant prostate cancer and suggested that these factors may contribute to the differences in prostate cancer risk and biology between blacks and whites" (p. 459). It should be noted that there is a considerable gap in our understanding regarding the biological determinants of prostate cancer. To date, scientists have been unable to precisely determine how biology interacts with behavior to affect how susceptible one is to getting prostate cancer.

Salami et al. (2007) noted that "despite the acceptance of the observation that CaP is more aggressive in black men, differential clinical management resulting in less aggressive investigation and/or treatment has been suggested as a factor in the poorer outcomes seen in this sub-population" (p. 459), adding, "This postulation has been supported by data that suggest that race/ethnicity as an independent predictor of CaP is conditional and dependent on age, stage and year of diagnosis, and that if diagnosed and treated early enough, the role of race as a factor in CaP outcome is significantly decreased" (p. 459).

Salami et al. (2007) also described what they termed a "disproportionate frequency of watchful waiting among AAM and Hispanics that was not completely explained by racial/ethnic variation in clinical characteristics or life expectancy" (p. 459). They concluded that there is "considerable evidence that there are racial/ethnic differences in the incidence and prognosis of CaP" (p. 461), and stressed the importance of continued research:

> The effect of black race and the environment on the molecular and clinical characteristics of CaP would be best investigated by looking at these indices in native black Africans and comparing them with findings in Africans in the Diaspora (USA, UK and the Caribbean) and whites…. Such studies would shed more light on the factors that determine the biology of CaP and may lead to a better understanding of the disease and improved treatment strategies, ultimately improving the health of men in this sub population specifically and in all men in general. (p. 461)

Similarly, Powell et al. (2010) noted that "nonfinancial barriers such as poor health seeking behavior were reported to delay PCa diagnosis in AAM" (p. 1793), and added that "fear of the PCa diagnosis and distrust of the health care system appear to be the most dominant factors" (p. 1793). Moreover, they remarked that "factors such as diet, obesity and hypertension impact PCa by association and some mechanistic processes were noted" (pp. 1794-1795), and specifically referred to the following findings:

> AAM have a higher fat content diet,18 are more obese with a higher body mass index19 and have a higher rate of hypertension than EAM.20 The

> latter 2 factors are components of metabolic syndrome. The mechanism associated with obesity and hypertension includes the release of inflammatory cytokines and reactive oxides and, thus, oxidative stress, DNA damage and NFkB activation. NFkB causes PCa cell proliferation. (p. 1795)

Further, Powell et al. (2010) reported that "a high fat content diet is associated with glucose-like growth factor 1 up-regulation" (p. 1795), adding that "the protein NFkB activates or up-regulates androgen receptor protein expression" (p. 1795). Powell et al. also noted the role of "autocrine motility factor receptor, CXC chemokine receptor R4 and matrix metalloproteinase 9, and found that these genes were more highly expressed in tumors from AAM than from EAM" (p. 1795). Further, Powell et al. reported that "these genes may be impacted by environmental factors, including diet, obesity and inflammation" (p. 1795).

Powell et al. (2010) also reported that the "incidence of PCa is approximately 60% higher and the mortality rate is 2 to 3 times greater in AAM than in EAM" (p. 1792). They noted that these "findings [had] been consistent for more than 20 years, before and after the PSA era" (p. 1792), and that men "of West African ancestry from the Caribbean and South America share incidence and mortality similar to those of AAM, suggesting a possible genetic basis of these outcomes" (p. 1792).

On the other hand, Powell et al. (2010) contended that "multiple factors probably contribute to these disparities" (p. 1792), and suggested that lack of access to care might be "responsible for disproportionate advanced disease and mortality in AAM compared to EAM" (p. 1792). In addition, these authors noted that "AAM continue to present with more advanced disease and a higher mortality rate" (p. 1793), and added that "financial barriers or the lack of insurance were also suggested as potential causes of the disparity" (p. 1793). Although Powell et al. reported on the Behavioral Risk Factor Surveillance Study, which showed insurance rates for AAM and EAM older than 50 years to be "81% and 89%, respectively" (p. 1793)—a statistically significant difference—this finding did not, in their opinion, "account for the entire disparity" (p. 1793).

Powell et al. (2010) noted that "PCa starts at the same time in AAM and EAM but becomes distant metastatic disease at a disproportionate rate of 4:1 in AAM to EAM beginning at ages 40 to 49 years" (p. 1794), and wrote:

> A recent report concluded that extensive HGPIN is associated with an increased risk of clinically significant PCa. Data suggest that at ages 40 to 49 years conversion to clinically significant PCa at disproportionate rates in AAM vs EAM may be the beginning of the PCa racial disparity. (p. 1794)

Powell et al. (2010) reported that "support for these observations and conclusion are based on volume and Gleason grade analysis from the RP database revealing higher Gleason grade PCa in AAM than in EAM at early ages (40 to 49 years). They noted that "volume and grade reflect PCa biology, [so] the analysis implies that PCa in AAM is biologically and genetically more aggressive than in EAM" (p. 1794). Finally, the authors stressed the idea that *"Cancer is a genetic disease, and the explanation of and answer to differences in incidence and disease progression should begin there"* (italics added, p. 1794).

To determine risks more clearly, Freedman et al. (2006) recommended "admixture mapping to identify a locus at 8q24 that substantially affects risk for prostate cancer" (p. 14071), noting that "African ancestry has not had much time to break up because of recombination and typically extend millions of base pairs" (p. 14068). "Although admixture mapping," the authors elaborated, "was first proposed >50 years ago and has good power to detect risk variants that are strikingly different in frequency across populations, it has not been practical until recently" (p. 14068). The process involves screening "through the genome of populations of mixed ancestry such as African Americans (5), searching for regions where the proportion of DNA inherited from either the ancestral European or African population is unusual compared with the genome-wide average" (p. 14068). Their study, they stated,

> shows that admixture mapping can be a powerful and practical way to map genetic variants for complex disease. The results motivate the application of

> admixture mapping to other disorders, especially those like prostate cancer in which incidence varies across populations. These results also highlight the scientific value of studies to find disease genes in specific ethnic groups, such as African Americans. (p. 14071)

While Freedman et al. (2010) focused on the idea of genome mapping, Holmes et al. (2012) concluded, from a study of 2,251 patients, that "obstacles to health care access rather than lack of awareness were the likely causes of the racial disparities" (p. 884), and "hypothesized that longer travel distance represents a barrier to biopsy and is associated with later stage at diagnosis" (p. 884). Holmes et al. "further hypothesized that long travel distance may disproportionally impact black patients compared to white patients" (p. 884), and reported that a "total of 6,490 patients 65 years old or older were diagnosed in 2004 to 2005" (p. 884), excluding patients that were "of nonwhite or nonblack race (41), had missing data on residence (49) or distance to a urologist (8), had a history of cancer (718) or a coding error in gender (44), or were diagnosed at autopsy or on the day of death (12)" (p. 884). Using "descriptive statistics … to examine the proportion of patients by key variables and stratified by distance group (0 to 10, 11 to 20 and greater than 20 miles from a urologist) and race" (p. 884), Holmes et al. found that "longer distance to a urologist was significantly associated with a diagnosis of higher risk prostate cancer," and that "distance to care disproportionally affects black patients" (p. 887).

Holmes et al. (2012) added that "a delay in care due to barriers such as distance to a urologist may be more likely to manifest clinically in black men, for example as high risk disease" (p. 887). Since distance, they noted, is "a potentially modifiable obstacle to care and may affect black patients more than white patients, intervention to decrease this barrier could lead to decreased racial disparities" (p. 887).

Research on Symptoms

According to Alcena (2013), symptoms of prostate cancer are divided into early symptoms and late symptoms. Early symptoms of prostate cancer include: (1) frequent urge to urinate, (2) difficulty passing urine, and (3) pain on urination. The symptoms of advanced prostate cancer include all of these symptoms listed above, as well as (1) blood in the urine, (2), urinary retention, (3) pain in the lower abdomen, and (4) urinary tract infections (p. 51).

Alcena (2013) also summarized the ways to diagnose prostate cancer, which include (1) a complete history, (2) a complete physical exam, (3) a digital rectal examination, (4) a count of the prostatic specific antigen (PSA), (5) an ultrasound of the prostate, and (6) a biopsy of the prostate (p. 52).

In addition, Alcena (2013) emphasized the importance of PSA testing, stating that the "PSA is crucial in establishing the diagnosis of prostate cancer" (p. 52), and that, in prostate cancer, "the PSA may be abnormally lower because of the higher blood volume the obesity creates" (p. 51). "This is particularly important in evaluating African American men," she wrote, "because of the high percentage of obesity that exists in African American men" (p. 52). In addition, Salami et al. (2007) noted that African American men "with metastatic CaP are also more likely than their white counterparts to have extensive disease and bone pain and poorer performance status, younger age at study entry, higher Gleason score, and higher PSA levels" (p. 459).

Alcena (2013) also emphasized the importance of the digital rectal examination, during which "the physician can tell if the prostate gland is enlarged, and if so, how enlarged," and noted that there "have been times … when the PSA was normal and a cancerous nodule was palpated" (p. 52). However, there is disagreement in the medical community about the use and validity of screening methods, as the next section describes.

Research on Screening Methods

Controversy surrounds what the appropriate guidelines for prostate cancer screening should be. Myers et al. (2010) described the screening process: “Prostate cancer is often diagnosed through prostate cancer screening, which includes digital rectal examination (DRE) and prostate specific antigen (PSA) testing” (p. 240). Because of some harmful consequences related to screening, guidelines have shifted over time.

For example, Knight (2014) reported, “False-positive prostate cancer screening results have been associated with persistent psychological distress, even with a negative biopsy” (p. 258). Moreover, Knight reported that there was “the potential for overtreatment of indolent prostate cancer that would be unlikely to progress during a man’s lifetime” (p. 257), and noted that “adverse consequences of surgical and radiation treatment for prostate cancer have been well documented, including pain, incontinence, sexual dysfunction, and bowel problems” (p. 257). As a consequence, Knight stated, the process is “surrounded by more controversy than many other health decisions” (p. 257), and is also “emotionally and cognitively complicated” (p. 259). In particular, Knight said that the benefits of prostate cancer screening have been questioned “for men older than 74, especially in those who have comorbidities and life expectancy less than 10 years” (p. 257).

Therefore, Knight (2010) wrote, the guidelines for prostate cancer screening during the past decade “have been revised to reflect evidence that PSA testing for prostate cancer is associated with significant harms related to overtesting and overtreatment of low-risk disease” (p. 258). Based on the evidence, he noted, “the US Preventive Services Task Force (USPSTF) does not recommend routine prostate cancer screening using PSA testing in men of any age” (p. 258).

However, Knight (2010) also noted that criticism has been raised about how the USPSTF interpreted the evidence: “The USPSTF presents the most limited use of

screening, discouraging PSA screening for men of any age and suggests that informed decision making be used only when men request a PSA test" (p. 258). Knight pointed out that "other professional and scientific organizations have developed alternate guidelines" (p. 258), and that these "offer patients and health professionals clear pathways for care that are based on evidence, consensus of experts, or best practices" (p. 258). Moreover, he emphasized: "Shared decision making is considered as an approach to helping men make these choices, and resources, such as patient decision aids, are discussed" (p. 258). He also contrasted USPSTF's guidelines with those of the American Cancer Society (ACS), which recommend that "average-risk men be screened for prostate cancer using PSA testing starting at age 50 if the man is informed about the alternatives to testing, the potential benefits, and the risk of harms" (p. 258).

Myers et al. (2011) reported that "prostate cancer screening is likely to remain controversial in the immediate future," and noted, "In this climate, it is imperative to identify effective methods for engaging adult male patients in shared decision about screening" (p. 245).

In their 2011 article, "A community-based intervention to promote informed decision making for prostate cancer screening among Hispanic American men changed knowledge and role preferences: A cluster RCT," Chan et al. (2011) concurred on the view that controversy surrounds PSA testing: "Although screening for prostate cancer with prostate specific antigen (PSA) is widespread, PSA testing remains controversial" (p. e44), and cited the following evidence as reason:

> Interim results from two large, randomized trials to determine the efficacy of PSA testing, the U.S. Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial and the European Randomized Study of Screening for Prostate Cancer (ERSPC), revealed at best, a modest reduction in prostate cancer mortality with regular PSA testing in the first decade of follow-up, and a substantial risk for over-diagnosis and over-treatment. (p. e44)

As a result, Chan et al. (2011) concluded, "promoting informed decision making for prostate cancer screening with PSA, as recommended by many professional guidelines, seems more appropriate than ever" (p. e44), and noted:

> Professional organizations recommend informing men of the potential risks and benefits of prostate cancer screening so that men age 50 and older (or age 40 if they are at high risk for prostate cancer, e.g., positive family history), can make an informed decision about whether to undergo screening. (pp. e44-e45)

Chan et al. (2011) also reported that: "Previous studies to promote informed decision making (IDM) for prostate cancer screening with PSA have focused on evaluating interventions, particularly decision aids, in various media (e.g., videotape, booklet, internet) delivered predominantly in clinical settings" (p. e45). In light of this, Chan et al. highlighted the "need for a community-based intervention to promote IDM for PSA testing arises from the limitations and barriers to promoting IDM in clinical settings, including "patient, physician, and system barriers: patient comorbidity, limited education/health literacy, physician forgetfulness, and lack of time in a clinical visit" (p. e45).

Like others, Knight (2014) stressed the importance of "shared decision-making" in the approach of contemporary guidelines to the question of prostrate screening (p. 258), and defined this as:

> typically involving communication between patient and health professional, where information is shared about the options in the choice (e.g., to screen or not) and the expected outcomes of each option (e.g., survival, side effects with treatment, anxiety, late detection of prostate cancer), including the scientific uncertainty surrounding the expected benefits and harms. (p. 258)

This process, according to Knight et al. (2014), often involves having the professional develop "an understanding of the man's values, goals, and preferences relevant to the options and where the trade-offs between the benefits and harms are considered from the patient's perspective" (p. 259). However, Knight et al. noted that existing guidelines do not equally stress this point. Some guidelines, they wrote,

"emphasize an informed decision-making approach in which the emphasis is placed on providing information and less on understanding the patient's values, goals, and preferences relevant to the choice" (p. 259).

Differences in screening guidelines and in emphasis on the nature of patient involvement persist. For example, Knight et al. (2014) reported that "the American College of Preventive Medicine recommends no routine screening at any age, but suggests that all men be informed about the potential risks and benefits of prostate cancer screening and that the man's preferences be considered in the final choice" (p. 259).

"The American Society of Clinical Oncology (ASCO) guidelines, and those of the ACS and the American Urology Association (AUA), also recommend that men be informed about the risks and benefits of screening," according to Knight et al. (2014), "and explicitly recommend a shared decision-making approach in which the information exchange occurs in the context of a discussion between a man and his health professionals" (p. 259).

Knight et al. (2014) further noted that screening for prostate cancer has come to be considered "a preference-sensitive decision in which several reasonable choice alternatives are available (e.g., screening vs no screening) that differ in terms of their characteristics and outcomes" (p. 259). They also referred to "effective decisions," the goal of which, in the case of prostate cancer screening, would be "implementation of smarter screening based on prostate cancer risk characteristics" (p. 259).

It is particularly relevant to this current study that Knight et al. (2014) mentioned the public's response to the revised guidelines, which "suggests that many men do not embrace recommendations to limit PSA testing and screening for prostate cancer" (p. 259). The authors stated that "Caire and colleagues found that most of those men seen in a screening clinic disagreed with the earlier USPSTF recommendations to discontinue screening at age 75" (p. 259). Knight also noted that "a survey of a national online panel found that 62% agreed with USPSTF recommendations against prostate cancer screening

with PSA, but only 13% intended to follow the guidelines and forego PSA testing" (p. 259).

Moreover, adoption of the revised guidelines has not created much change in the practices of healthcare providers. Knight (2014) wrote that adoption of the USPSTF recommendations among primary care providers has been modest: "Among 89 primary care providers responding to a national Internet survey in 2010, 51% and 64% indicated that they discuss and order PSA testing for men between 50 and 74, respectively" (p. 261). Further, Knight highlighted: "28% indicated that their screening practices had been influenced by the 2009 publications of the European Randomized Screening for Prostate Cancer and the Prostate, Lung, Colorectal and Ovarian trials, respectively" (p. 261); and listed the following reasons for the lack of significant change in providers' practices:

> Providers cited several barriers to stopping PSA testing in their patients who had previously participated in prostate cancer screening, including patient expectations of screening, lack of time to discuss changes in recommendations, worry about malpractice litigation, and discomfort with uncertainty. (p. 261)

Knight (2014) also noted, however, that some USPSTF guidelines recommended shared decision making and stated that "the choice of screening be based on the man's preferences" (p. 262). He elaborated:

> The types of shared decision making suggested by the guidelines include (1) providing information on the alternatives for prostate cancer screening, potential benefits and harms, and uncertainties associated with the various outcomes, and (2) assessing the man's preferences for screening alternatives (e.g., PSA testing vs no PSA testing) or for the potential outcomes and downstream impacts of screening (e.g., survival, false-positive rate, anxiety associated with prostate cancer, treatment and its associated impacts on urinary and sexual function). (p. 262)

Despite this growing focus on shared discussion, Knight (2014) emphasized that little of such interaction has actually taken place between physicians and their patients:

> A recent nationally representative sample of men between ages 49 and 75 responding to the National Health Interview Survey reported that most (64.3%) had not had any previous discussions with their physicians about PSA screening and its benefits and harms and associated uncertainties, and only 8% of the respondents reported discussion of 3 key elements of shared decision making (i.e., advantages, disadvantages, and scientific uncertainties). (p. 262)

Knight (2014) also concluded: "The absence of shared decision making was associated with no screening rather than with screening" (p. 262). Moreover, Knight reported: "Current guidelines are in agreement … on the importance of taking an informed decision-making or a shared decision-making approach to prostate cancer screening" (p. 264); and elaborated: "Informed or shared decision making endorses providing patients with information on the potential benefits and harms associated with screening and considering what is important to a patient in evaluating the benefits and harms" (p. 264). Knight concluded that it was important to include "improved knowledge, realistic perceptions of the benefits and harms, lower decision conflict, and improved agreement between the man's values and his choices about screening" (p. 264).

While Chan et al. (2011) found that Hispanic men were at lower risk for prostate cancer than non-Hispanic Whites, he also found that "they are more likely to die from prostate cancer," and wrote that "this may reflect a lower likelihood of timely, high quality treatment. Hispanic men are less likely to have heard of the PSA test or to have used it, and Hispanic men who have had this test are less likely to report discussing pros and cons of the test with their physician" (p. e45). As a result, Chan et al. emphasized "the need for a culturally appropriate intervention to promote IDM for prostate cancer screening with PSA among Hispanic men in El Paso, TX" (p. e45).

Knight (2014) noted that "shared decision making is a central principle embodied in the Institute of Medicine concept of patient-centered care, including decisions about screening" (p. 262). He also weighed in on the value of patient decision aids, stating that:

> Patient decision aids are decision support technologies that have been developed to support shared decision making, to improve the quality of the

> decision, and to reduce variation in care and unnecessary tests and treatment.… Distinct from patient education materials, patient decision aids aim to provide information that is based on the considerations and concerns that patients have in making the decision and that is balanced and free from bias. (p. 262)

Knight (2014) reported that "prostate cancer screening decisions are significant to men and their families, considering the potential for benefits, including survival and the possibility of harms from overtesting and overtreatment" (p. 264). Knight added that "these decisions are challenging because of emotions associated with prostate cancer, as well as common cognitive tendencies" (p. 264).

Myers et al. (2011) reported that "a recent report using data from the National Cancer Institute's Surveillance, Epidemiology, and End Results program is consistent with this view" (p. 240). They also reported that "current prostate cancer screening guidelines recommend that informed, shared decision making should be part of routine primary care for older adult men" (p. 240). However, like Knight (2014), they noted that, "in practice … most men have little or no discussion about prostate cancer screening with a primary care provider" (p. 240), and they concluded that "there is a pressing need for methods to facilitate informed and shared decision making about prostate cancer screening use" (p. 240).

Heidenreich et al. (2011) also stated that "the decision to undergo early PSA testing should be a shared decision between the patient and his physician based on information balancing its advantages and disadvantages" (p. 63), and noted that "the main diagnostic tools to diagnose PCa include DRE, serum concentration of PSA, and transrectal ultrasound (TRUS)–guided biopsies" (p. 63). Heidenreich et al. reported: "In about18% of all patients, PCa is detected by a suspect DRE alone, irrespective of the PSA level [14] (LE: 2a)" (p. 63). The authors added that "a suspect DRE in patients with a PSA level of up to 2ng/ml has a positive predictive value of 5-30%" (p. 62).

Costanza et al. (2011) reported that "considerable controversy exists about the effectiveness of prostate specific antigen (PSA) screening in reducing mortality from

prostate cancer (PCa), although there is good evidence that the PSA test can detect early stage prostate cancer" (p. 193). Most organizations, they stated, "recommend that men should be given the opportunity to discuss the benefits and risks of PSA testing with their primary care providers (PCPs) before making a screening decision" (p. 193). However, they noted:

> Two recent reports of randomized trials of PSA screening have done little to resolve the screening controversy. One study showed no mortality benefit. The other identified a small impact of PSA testing on PCa mortality but was associated with considerable human and financial cost due to overtreatment. (p. 193)

Costanza et al. (2011) reported: "Whether PSA testing can significantly reduce PCa-specific mortality has resulted in some PCPs who strongly recommend PSA testing, some who strongly recommend against, and few who inform men about the pros and cons and share in the decision-making process" (p. 193). They continued:

> To make an informed decision, the US Preventive Services Task Force suggests that one should understand the risk or seriousness of the disease and the preventive service offered, one should understand its risks, benefits, alternatives, and uncertainties and one should weigh his values regarding potential harms and benefits before engaging in decision making. Decision making may be shared with one's provider and sharing may range from no sharing at all to ceding the decision making to the PCP. (p. 193)

Myers et al. (2011) noted that "decision aids (e.g., print materials, telephone contacts, videos, and Internet tools for providing information), have been investigated as a means to increase patient prostate cancer screening knowledge and involvement in decision making about screening" (p. 240). Myers et al. found: "The studies have sought to assess decision aid impact on patient knowledge, decisional conflict, and screening use" (p. 240), and reported the "findings from a randomized controlled trial, referred to as the Decision Counseling Trial (DCT) (p. 240), which was "designed to test the impact of nurse-mediated decision support on patient prostate cancer screening knowledge and decisional conflict (primary outcomes) and on informed decision making and actual screening use (secondary outcomes) (pp. 240-241). On their endpoint survey, Myers et al.

reported that "97% of the EI [Enhanced Intervention] Group respondents reported that they remembered discussing prostate cancer screening with the nurse educator and 87% said that they would recommend such a discussion to other men" (p. 242).

Costanza et al. (2011) concluded that "most aids increase knowledge and help subjects feel more confident about their decision" (p. 194), and added that a PCa screening decision aid "should … not promote screening but rather promote informed decision making that is congruent with a man's values and understanding" (p. 194). They further stated that a good decision aid:

> should (1) improve knowledge of the problem, options, and outcomes, (2) create realistic expectations of outcomes, (3) clarify personal values for outcomes, (4) promote congruence between values and choice, (5) reduce decisional conflict, (6) promote implementation of choices and (7) improve satisfaction with decision making. These standards seem to us and others to apply to decision making around cancer control issues in general and PSA screening, in particular. (p. 194)

Treatment of Prostate Cancer

Heidenreich et al. (2011) claimed that "it is usually impossible to state that one therapy is clearly superior over another because of the lack of randomized controlled trials in this field… however, based on the available literature, some recommendations can be made" (p. 64). Accordingly, Heidenreich et al. offered "a summary, subdivided by stage at diagnosis," and "proposed a few suggestions to follow regarding the different treatment options available" (p. 64). To begin with, they stated:

> Active surveillance (AS) must be differentiated from WW. The latter is based on a delayed symptomatic noncurative treatment in patients who are not candidates for an aggressive local therapy, whereas the former must be seen as suitable therapy for those who might also be offered a curative approach. Such patients with very low-risk PCa are initially not treated but are followed and treated with a curative intent if progression or the threat of progression occurs during follow-up. (p. 64)

Heidenreich et al. (2011) reported, “AS was conceived with the aim of reducing the ratio of overtreatment in patients with clinically confined low-risk PCa based on early data demonstrating that men with well-differentiated PCa have a 20-yr PCa-specific survival rate of 80-90%” (p. 64). They also noted that “three prospective randomised trials [had] assessed the role of immediate postoperative radiotherapy” (p. 66). “Although different in inclusion criteria, “ Heidenreich et al. added, “all trials concluded that immediate postoperative radiotherapy significantly improves 5-yr clinical or biologic survival by about 20% ($p < 0.0001$)” (p. 66). They further reported that “three-dimensional conformal radiotherapy (3D-CRT) is the gold standard, and intensity-modulated radiotherapy (IMRT), an optimised form of 3D-CRT, is becoming more widely used as is image-guided radiotherapy” (p. 66), adding: “In radical prostatectomy (RP) specimens, both the primary and the secondary Gleason grade should be reported” (p. 62), as well as the “presence of the tertiary grade and its approximate proportion of the cancer volume” (p. 62).

“For external radiotherapy, a dose of at least 74 Gy is recommended for the management of low-risk PCa,” Heidenreich et al (2011) wrote, “because biochemical disease-free survival is significantly higher when compared with a dose <72 Gy (69% vs 63%; $p = 0.046$)” (p. 66); while “for intermediate-risk PCa, many series have shown a significant impact of dose escalation on 5-yr progression free survival in cT1c–T3 PCa, with a dose ranging from 76 to 81 Gy” (p. 66). They also reported that “transperineal brachytherapy is a safe and effective technique for low-risk PCa” (p. 67). In patients with high-risk disease, they said that

> external irradiation with dose escalation improves 5-yr biochemical disease free survival but seems insufficient to cover the risk of systemic relapse. For intermediate and highly localised PCa, a combination of external irradiation with 6 mo of ADT resulted in a 13% improvement in the 8-yr OS rate ($p < 0.001$). For locally advanced PCa, the data of the EORTC-22961 trial demonstrated a 4.7% benefit in OS after a median follow-up of 5.2 yr in favour of 3-yr ADT when compared with short-term ADT. (p. 66)

Heidenreich et al. (2011) elaborated on follow-up care, reporting that "patients diagnosed with PCa who underwent local treatment with curative intent are usually followed for at least 10 yr or until advanced age makes follow-up superfluous" (p. 68). Heidenreich et al. added that "determination of serum PSA together with a disease-specific history can be supplemented by DRE if locally recurrent disease is suspected" (p. 67). However, they noted that "long-term results are lacking, and 5-yr biochemical progression-free rates are inferior to those achieved by RP in low-risk patients" (p. 68). Therefore, Heidenreich et al. stated, "patients must be informed accordingly" (p. 68). They also noted that "the results of a randomised trial of EBRT versus CSAP in patients with clinically localised PCa [had been] published recently and presented promising results" (p. 68).

Crawford et al. (2014) conducted a literature search "using the following terms: prostate cancer, guidelines, metastasis, and imaging. Relevant US and European clinical practice guidelines were reviewed, and recommendations of scanning for metastatic disease in patients with prostate cancer" (p. 665). They found "no consensus on optimal indications or methods for imaging" (p. 665), also noting "a lack of consensus on when to initiate imaging for metastases and frequency of testing in clinical practice" (p. 665), and concluded that "evidence-based recommendations focus mainly on primary prostate cancer staging and not on follow-up after biochemical recurrence or hormonally refractive disease" (p. 665).

Crawford et al. (2014) further noted a "disparity and a lack of agreement in the current clinical practice guidelines and available literature on patient selection, imaging modality, and timing of scanning for metastatic disease, which represents a key transition that influences the treatment decision-making process" (p. 665). They also noted that "false positives occur from trauma and various other noncancerous sources (p. 667)," and added that "microscopic infiltrations are not detected, and osteolytic lesions are poorly detected, limiting sensitivity and specificity" (p. 667). In addition, they noted that "other

imaging modalities, such as plain radiography, computed tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography/computed tomography (PET/CT), might be needed to clarify equivocal lesions" (p. 667).

Investigating further, Crawford et al. (2014) noted that "approximately 10%-20% develop castration-resistant prostate cancer (CRPC) within approximately 5 years of follow-up" (p. 664), and stated that "50% of patients will have evidence of biochemical prostate specific antigen (PSA) disease recurrence at 10 years after treatment with radical prostatectomy or radiation therapy" (p. 664). Moreover, Crawford et al. elaborated that: "ninety percent of men with metastatic CRPC (mCRPC) have a rising PSA with more than 80% having bone metastases and more than 20% having soft tissue metastases, mainly in the lymph node" (p. 664). Crawford et al. discussed that "the median survival from CRPC diagnosis varied from 9 to 30 months in different studies" (p. 664). The authors also noted that a recent study "showed reasonably low incidences of bone metastases in newly diagnosed asymptomatic patients with a PSA level < 20 ng/mL and Gleason score < 6, suggesting a bone scan is not necessary as a routine examination at the initial staging of prostate cancer" (p. 665). Further, they stated that "other studies found that approximately 25% of patients with bone metastasis had a PSA level < 20 ng/mL and Gleason score < 7, and bone scans might be necessary in patients with a PSA level between 10 and 20 ng/mL" (p. 665). On the basis of these studies, Crawford et al. concluded: "Because metastasis occurred at a low PSA level before symptoms, it was suggested that patients with biochemical progression need to be managed with regular bone scans to detect metastasis even if PSA is low" (p. 665).

Crawford et al. (2014) reported: "Frequent post-treatment PSA surveillance has resulted in earlier detection of progression and metastases and has influenced treatment trends" (p. 664), and added that "the presence or absence of metastases is one of the most important factors influencing the selection of therapy in prostate cancer" (p. 664). "In each disease state," they noted,

> there are important therapeutic implications when metastases are found radiographically. With initial prostate cancer staging, definitive local therapy with surgery or radiation might not be pursued in patients found to have metastatic disease. After local therapy, biochemically recurrent prostate cancer is often treated with intermittent androgen deprivation therapy (ADT). (pp. 664-665)

Crawford et al. (2014) concluded that "different approaches to ADT should be pursued in these distinct clinical states" (p. 665), noting that "there is no U.S. Food and Drug Administration approved therapy for M0 CRPC, yet recent advances in mCRPC have led to regulatory approval of multiple agents carrying low toxicity, yet significant survival or supportive care benefits" (p. 665). They also highlighted the fact that "the most recent published American Urological Association guidelines for early detection of prostate cancer and the management of CRPC made no recommendations on appropriate timing of imaging in M0 patients to monitor disease progression" (p. 665), and noted that "findings from clinical validation studies demonstrate a lack of consensus on the standard of care for detection of metastatic disease in prostate cancer" (p. 665). However, Crawford et al. stated,

> A study conducted by Even-Sapir et al37 demonstrated that NaF PET/CT is a highly accurate modality (100% for sensitivity, specificity, positive predictive value, and negative predictive value) for the detection of bone metastases in patients with prostate cancer. It can detect many metastatic lesions overlooked by bone scan. A prospective study in patients with biochemical relapse of prostate cancer showed that NaF PET/CT is useful in the detection of occult osseous metastases and that its positivity tends to associate with increasing PSA level and might occur in lower PSA ranges than conventionally recognized. (p. 665)

Crawford et al. (2014) also stated that "pelvic lymph node dissection is currently the gold standard for evaluating the presence of nodal involvement in men undergoing a radical prostatectomy deemed at risk" (p. 667), and added that "there are limited imaging methods for detecting nodal involvement in patients with prostate cancer" (p. 667). According to Crawford et al., "reliable and optimal detection rates have not been achieved by CT or MRI or even with PET/CT using 18F-fluoromethylcholine or 18F-

fluorodeoxyglucose" (p. 667). They further discussed the use of "PET/CT scan with new tracer 11C-choline," and said it "has been demonstrated to be highly specific and more sensitive than PET alone or MRI as a noninvasive means of staging pelvic lymph nodes in prostate cancer" (p. 667). "Taken together," they concluded, "modern imaging modalities have improved accuracy but have major limitations, including variations in accuracy, high cost, and lack of availability" (p. 667). They also noted that questions still surround the issue of imaging: "What is the preferred imaging modality? At what time point and frequency should imaging be done? They also recognized that there are distinct patient groups to be used in the evaluation of metastatic disease in prostate cancer" (p. 668).

Crawford et al. (2014) suggested that "prospective, rigorously controlled, clinical imaging trials are needed to establish the optimal role of new imaging strategies in prostate cancer, so appropriate patient management decisions can be made early in this disease stage" (p. 667); and also stated: "Initiating proper clinical strategies for the detection of metastases in advanced prostate cancer is important for optimal patient management" (p. 668). Noting that "recommendations to promote early identification of metastatic disease were developed during the workshop with the objective of improving clinical patient management and facilitating appropriate treatment practices" (p. 668), they stressed the need for further research: "To definitively conclude that refinements in imaging could improve survival for patients with prostate cancer, prospective, rigorously controlled, clinical imaging trials will be needed" (p. 668).

While studies about their efficacy and suitability need to catch up, options for treatment of prostate cancer are constantly changing and expanding, as the Interactive Treatment Chart, created by the Dattoli Cancer Treatment Centers (1993, 2015), indicates. In its entirety, the chart includes the risks associated with each methodology, the pros and cons, any long-term studies that have been published, and medical indicators for each type of treatment. But it will suffice here to list the types and a brief description:

(1) **Calypso®**—a new radiation program that uses GPS technology to focus the radiation beam; (2) **Cryotherapy Cryosurgery Cryoablation**—freezes and thaws cancer cells to destroy them; (3) **Focal Cryotherapy**—a salvage treatment for recurrent disease; (4) **Cyberknife®**—a form of external radiation therapy; (5) **HIFU (High Intensity Focused Ultrasound)**—utilizes focused sound waves to ablate cancer cells; (6) **Hormonal Therapy-Androgen Deprivation Therapy (ADT)**—utilizes hormones to decrease testosterone production and inhibit production and growth of cancer cells; (7) **Radiation**—of different types targets and destroys cancer cells; (8) **Brachytherapy**—implantation of radioactive sources (e.g., seeds or pellets) directly into the prostate and the tumor; (8) **Palladium103**—a radioactive isotope with a short half-life that spares surrounding tissue; (9) **Iodine125**—a longer half-life than Palladium, which exposes more of the surrounding tissue; (10) **High Dose Rate (HDR)** —temporary brachytherapy implants using Iridium 192; (11) **Combination Therapy**—two or more types of radiation, sometimes with the addition of hormones; (12) **EBRT-External Beam Radiation Therapy**—fractionated photon doses; (13) **IMRT-Intensity Modulated Radiation**—uses protons; (14) **DART-True Dynamic Adaptive Radiation**—uses components of 4G image-guided, intensity-modulated radiotherapy (4D IGIMRT), enabling state-of-the-art control of photon beams; (15) **Adaptive Radiation Therapy**—uses neutrons to kills cancer cells; (16) **Proton Therapy**—uses proton beams, often combined with photons; (17) **RapidArc®**—a new product that uses single radiation rotation; (18) **Tomotherapy**—computed tomography-guided IMRT; (19) s**urgery**—the former gold standard of treatment; (20) **Radical Prostatectomy**—surgical removal of most of the gland; (21) **Robotic "da Vinci" Laparoscopic**—robotic equipment removes the gland through small abdominal openings; (22) **Watchful Waiting**—no treatment, just periodic retesting; (23) **Expectant Surveillance**—similar to watchful waiting but also includes ingesting complementary medicines and homeopathic substances.

Interventions Designed to Increase Awareness, Screening, and Adherence to Treatment Recommendations

The research that Chan et al. (2011) conducted among Hispanic men in Texas led them to the conclusion that a "culturally appropriate intervention to promote IDM for prostate cancer screening with PSA" was needed in this group (p. e45). They "developed a community-based intervention guided by formative research to assure that the intervention would be grounded in the men's social experience" (p. e45) and "involved community partners in the development and implementation of the intervention and several aspects of the evaluation process" (p. e45). Further, as they noted,

> Because the intervention was implemented in natural non-clinical settings we used a cluster randomized design to assess the short-term impact of our intervention on men's knowledge about prostate cancer screening, their preferred role in decision making about screening with PSA, beliefs related to informed decision-making, and screening intentions. (p. e45)

Chan et al. (2011) administered surveys "before and after the intervention or for controls, after the discussion of the diabetes video, by the protomores who read the questions to the group" (p. e46); the questions included "age, race/ethnicity, country of birth, education, health insurance, whether they had a partner, and self-reported health" (p. e46). In addition, they asked whether subjects had ever heard of a PSA test or digital rectal exam (DRE), or had had experience with PSA or DRE.

"A major theme in our focus groups," Chan et al. (2011) reported, "was that the men had difficulty understanding that anyone would think there is a decision to be made about prostate cancer screening" (p. e46). To address this issue, the researchers developed new items to assess this "normative belief and how it might have changed after the intervention to an understanding that there is a decision to be made about prostate cancer screening" (p. e47). They described these changes as follows:

> We assessed this change with questions: "It is important for a man to think about what he would do if he has an abnormal test result before getting tested for prostate cancer;" "It is important for a man to weigh the potential

> pros and cons of getting tested for prostate cancer before deciding whether or not to be tested." (pp. e46-e47)

Chan et al. (2011) "asked five questions adapted from the Speilberger State Anxiety Scale" (p. e47), noting that the items "asked whether the program made the participant have various feelings about making the decision" (p. e47). In addition, "Five items from the Ottawa acceptability compendium asked about general aspects of the program, clarity of explanations, balance of the program, amount of time for discussion, quantity of information, and total length of the program" (p. e47).

Chan et al. (2011) reported: "Our study demonstrates the feasibility of developing and implementing a community-based intervention to promote informed decision making (IDM) for prostate cancer screening with PSA" (p. e49). Chan et al. noted, "Although there have been many studies involving decision aids delivered in clinical settings to patients, our study shows that informed decision making can be promoted in community settings to community residents" (p. e49).

Chan et al. (2011) highlighted: "We engaged community members in the formative work leading up to the development of our intervention" (p. e49). Chan et al. noted: "Interventions to promote IDM for PSA testing have been delivered through the Internet or postal mail" (p. e49). Chan et al. concluded that "delivering the decision aid in small group settings by trusted lay health workers as we did in our study, we demonstrated the feasibility of delivering an IDM intervention outside of clinical settings to underserved Hispanic men" (p. e49).

Chan et al. (2011) stated, "This finding may be related to low income and/or to low health literacy" (p. e49). Chan et al. reported, "In the 2000 National Health Interview Survey, approximately 34% of Hispanic men who had taken a screening PSA test did not report a discussion with their physician about the advantages and disadvantages of screening" (p. e49). "Taken together," Chan et al. stated, "these findings suggest that a sizable number of Hispanic men are undergoing PSA testing with little knowledge about

it, little discussion about it, and without participating in this decision with their physician" (p. e49).

Interestingly, however, Chan et al. (2011) noted that:

> The complexity of promoting the idea of ''informed decision making'' for a screening test was highlighted by our findings that 44% of men in the intervention group believed that the program was trying to encourage men to get tested and that 51% of men thought that the program was trying to encourage men not to get tested. (p. e50)

"Consistent with studies evaluating decision aids for prostate cancer screening," Chan et al. (2011) wrote, "we found that intervention participants moved toward a more active role in decision making, compared with the control group" (p. e50). "After the intervention," they said, "intervention participants moved to more active role preferences for both the prostate cancer screening decision and general health care decisions, relative to the control participants" (p. e48). This difference, they found, "was statistically significant for prostate cancer screening and close to the $p < 0.05$ criterion for general health decisions" (p. e48). In addition, they evaluated a number of other responses on the part of the participants:

> A minority of intervention participants reported any stress following the session. The most common feelings were being tense (34%) and/or worried (24%). Participants said that the program showed why there is a decision to be made about testing (97%), that the decision depends on what matters most (values) (99%), helped them think about how much say they wanted in making the decision (97%), and showed all sides of the decision (98%). (p. e49)

In discussing the limitations of their findings, Chan et al. (2011) noted that they had "assessed men immediately after they had completed the program, rather than over a longer follow-up period because of budgetary constraints" (p. e50). Because of this constraint, they stated, it was possible that their findings "reflected the short-term impact of our intervention which may diminish with time" (p. e50). They also reported that their study was "the first to show that underserved Hispanic men lack knowledge about prostate cancer screening and can become more informed about the facts about screening

through a community based intervention program delivered in small group settings" (p. e50). It could, they added, "encourage underserved Hispanic men to take a more active role in their decision making process, make them more aware of weighing the pros and cons of screening, and imbue them with greater awareness of the downstream consequences of screening" (p. e50).

Myers et al. (2011) found that "endpoint decisional conflict was equally low among men in both study groups" (p. 243). Myers et al. reported that "this finding differs from earlier studies that have reported increased and reduced decisional conflict in response to the use of decision aids" (p. 243). As Myers et al. suggested, "differences in study design and intervention methods may help to explain such variation in decision aid impact on decisional conflict" (p. 243). Myers et al. added that:

> The approach tested in this study involved training primary care practice nurses to prepare patients for a discussion of screening with their physician. Our findings suggest that nurse-led decision counseling may help to increase patient knowledge and influence IDM without increasing decisional conflict. (p. 245)

Myers et al. (2011) reported: "It has been proposed that decision counseling should be part of routine primary care" (p. 245), and said that a move toward implementing this recommendation … policymakers should acknowledge the time and effort involved in delivering well-documented, effective decision support services, and provide adequate compensation for improving this aspect of medical care. Providing effective mediated decision support on a large scale may have salutary effects on patient adherence and satisfaction (p. 456).

In 2007-2008, Costanza et al. (2011) conducted a pilot study: to "(1) evaluate the effectiveness of computer-assisted telephone counseling (CATC) as a decision aid for men considering PSA testing and (2) to present a testable surrogate for discussion and decision sharing with one's PCP (p. 194). They noted: "The more common model of informed decision making includes a decision aid (print, video, etc.) with no or limited

live interaction between decision aid and subject, sometimes followed by discussion and/or shared decision making between patient and PCP" (p. 194). Their eligibility criteria for the study were: "being male, ability to speak English, age 50-70 years (45-70 for African Americans), no history of PCa and no PSA test in the last 12 months" (p. 194).

For their study, Costanza et al. (2011) sent a booklet to their participants, followed by a call from a telephone counselor. They followed CATC protocol, and noted that "the booklet was patterned after the PROCASE booklet of Partin et al. who had included concepts that patients, urologists and oncologists consider key to understanding PCa and the PSA test" (p. 194). Further, they noted that the booklet was later revised "with the help of a low literacy consultant … to accommodate low literacy participants at a 5th grade reading level" (p. 194), and said it "ultimately included findings from focus groups and key informant interviews with African-American and non African-American and low-literate men" (p. 194). They reported:

> Overall, the intervention was well received by the men. Almost all considered the booklet and the counseling improved their knowledge of PCa and PSA. We believe the booklet and counseling presented a balanced picture, neither for nor against testing. This contention is supported by two facts: (a) men in two focus groups reviewed the booklet and informed us that the booklet was not biased but balanced regarding PSA testing and (b) men who had not made a decision prior to the intervention were equally apt to make a pro or a con testing decision following the intervention. (p. 198)

Although Costanza et al. (2011) cautioned against generalizing their findings because most of their participants were "white, middle class and well educated" (p. 198), they stated that: "Our pilot study was successful in significantly improving knowledge, decreasing decisional conflict, increasing decisional satisfaction and increasing the number of men making a decision about PSA testing" (p. 198); and concluded that:

> We believe the intervention, combining print material with a CATC system provides realistic and effective decision support for men facing a difficult decision and could potentially substitute for discussion of PSA

> testing with their PCPs. However, in the absence of a controlled trial, this is speculation. (p. 199)

Heidenreich et al. (2011) reported, "There is currently no evidence for introducing widespread population-based screening programmes for early PCa detection in all men" (p. 62), and cited the following results of a major cancer screening trial, in which randomly assigned 76,693 men were randomly assigned "to receive either annual screening with prostate-specific antigen (PSA) or digital rectal examination (DRE) or standard care as the control" (p. 62):

> After a follow-up of 7 yr, the incidence of PCa per 10 000 person-years was 116 (2820 cancers) in the screening group and 95 (2322 cancers) in the control group (rate ratio: 1.22). The incidence of death per 10 000 person-years was 2.0 (50 deaths) in the screened group and 1.7 (44 deaths) in the control group (rate ratio: 1.13). The PLCO project team concluded that PCa-related mortality in screen-detected individuals was very low and not significantly different between the two study groups. (p. 62)

The absolute risk difference revealed by this trial, according to Heidenreich et al. (2001), "was 0.71 deaths per 1000 men" (p. 62), which means, the authors concluded, "that 1410 men would need to be screened and 48 additional cases of PCa would need to be treated to prevent 1 death from PCa" (p. 62). Based on these data, Heidenreich et al. noted that "the real benefit of the ESRPC trial will only be evident after 10–15 yr of follow-up…. Furthermore, we have to wait for the results of the economic burden and the side effects resulting from more intensive screening" (p. 62).

Research on E-Health

In addition to the initiatives noted above, which were undertaken to determine whether patient education and information—via a variety of delivery options—influence patient decision-making about care, e-options are also being tried. "Recently," Misra and Wallace (2012) noted, "both Google (Google Health) and Microsoft (HealthVault)

introduced publicly available, Internet-based PHRs at no cost" (p. 220). The authors also cited the fact that:

> Other relevant research was conducted with a sample (n=220) of primarily young African American and Hispanic women with a mean age of 32 years (Bacon, 2007). Data showed that the vast majority (72.5%) had been using the computer and Internet to access healthcare information for a period greater than 6 months—as a well-maintained behavior. In addition, the women reported high levels of self-efficacy or confidence in using the computer and Internet to access websites providing healthcare information. (p. 219)

According to Misra and Wallace (2012), "Accessing such online health information gives individuals privacy, and helps people to make important decisions—whether for themselves or others" (p. 220). The authors consider it

> important to explore how design and presentation modalities incorporating user-centered design can contribute to the efficacy of health communication across health literacy levels—whether presenting health information via various large or small computer devices such as personal computers, mobile iPhones, interactive television. (p. 216)

But how exactly are these e-options defined? According to Misra and Wallace (2012), "There is evidence that e-health should be defined ever so broadly." To support this, they cite Eysenbach's (2001) definition of e-health, noting the importance of his description of e-health as:

> an emerging field … referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a … commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology. (p. 218)

Citing Fox and Joes (2009), Misra and Wallace (2012) found that

> 61% of American adults have looked online for health information and about two-thirds talked to someone else about what they found online. In addition, about half of the respondents reported having read online other peoples' commentary or about their experiences with health issues. (p. 219)

This "tremendous growth in electronic health information technology," Misra and Wallace (2012) state, "necessitates attention being paid to the task of designing the e-health message, and to evaluating what has been designed" (p. 217). Moreover, they note that "one may identify the field of *Health Informatics and Information Technology* (HIIT) as one characterized by new advances that are constantly emerging," and specify that the "available range of effective HIIT tools support … the receipt, processing, transmission, retrieval, protection, and analysis of vast amounts of information and data" (p. 217). "The breadth and scope of HIIT," the authors conclude, "encompasses the global tracking of diseases, as well as reaching underserved populations, thereby impacting health disparities" (p. 217). They went on to cite Adams and Leath (2008), who drew "upon information disseminated by the World Health Organization in identifying potential outcomes from the use of information and communication technology" that includes, among other features, the creation of "national and local information systems supporting the development of effective, efficient and equitable health systems" (Misra & Wallace, 2012, p. 217). "Clearly," Misra and Wallace concluded, "HIIT can make vital contributions both its nationally and globally" (p. 217), through efficiency, enhancing quality of care, being evidence-based and empowering for the public, who can access their medical records electronically and select evidence-based health care. In addition, Eysenbach (2001) noted that e-options encourage new partnerships and the education of medical doctors and consumers/ patients via online information, enable the exchange of information and communication across agencies, and extend "the conventional geographic and other boundaries of conventional health care via access to global providers online." He also noted that "e-health can either make health care more equitable, or widen the gap between those who have versus those who do not have access to computers and Internet networks" (p. 219). As Misra and Wallace (2012) noted, Prochaska (2008) "pioneered the design of innovative interactive computer-based approaches that can enhance health, reduce health care costs, and provide more inclusive

care" (p. 227); and added that Prochaska "described the results of interactive computer-based interventions delivered at home via programmed algorithms; findings on interventions for cigarette smoking cessation revealed how interactive computers alone produced a 24% abstinence rate" (p. 227). They continued:

> In support of the assertion that Prochaska's (2008) pioneering approach produces a more inclusive approach to treatment, as social justice, consider the following evidence:
>
> Across our population trials, we found that African American smokers and Hispanic-American smokers had somewhat higher quit rates than non-Hispanic Whites. The oldest smokers had the highest quit rates…. Treatment stereotypes have suggested that certain populations, like younger, older, minority, or impaired individuals do not have the same ability to change. These results indicate that the problem is not inability to change: the problem is inaccessibility to quality change programs. (pp. 227-228)

Misra and Wallace (2102) also said that Prochaska "suggested a viable future … in which emerging paradigms 'need to rely much more on proactive approaches to reaching entire populations' … delivered primarily by patients using technologies at home" (p. 228).

However, and this is essential, Misra and Wallace (2012) cautioned that those who manage information in health care "must also be concerned about the process of designing the e-health message," and stressed that the information "to be communicated to providers and consumers should reflect the use of designs that permit effective engagement and knowledge acquisition" (p. 217). "One of the major challenges in consumer health informatics," they stated, "is to provide consumers with relevant information (that is contextualized and personalized), and to ensure that the information is presented is such a way that consumers can understand and act upon the information" (p. 220). "What emerges as critical in e-health design," they noted, is paying "sufficient attention … to health communication and health literacy" (p. 221).

To further emphasize the importance of designing appropriate and effective e-messaging, the authors cited Woo (2008), who

> asserted the importance of websites being linguistically and culturally appropriate.… In brief, Woo (2008) stressed the importance of the design of e-health effectively engaging users, providing information, and having interactive components—such as a chat room, question and answer service, e-mail service, and videos/films. (p. 218)

Misra and Wallace (2012) contend that "an effective strategy involves first identifying the target audience, then assessing what they want, think, feel, and do when it comes to a particular health issue" (p. 220), and point out that "it is important for designers to keep in mind *social and cultural factors* that inform design," noting that:

> Designers of e-health must strive to identify and consider *categories of consumers*. As technology expands, new categories of consumers may arise. This necessitates future research which expands the base of knowledge about categories of consumers. This information may then be used in designing e-health messages for specific categories of consumers. (p. 232)

Misra and Wallace (2012) conclude that there is "an imperative to meet the needs of the growing number of consumers seeking out and accessing e-health," and that both "research and attention to the design of e-health messages emerge as vitally important" (p. 220). E-health, they stress, "should be easy-to-use, entertaining, and exciting" (pp. 218-219).

Theories Guiding the Study: Stages of Change and Self-efficacy

Two theoretical frameworks guided this study: (1) The "transtheoretical model" (TTM) of change developed by Prochaska and DiClemente, (1983), and (2) the self-efficacy model developed by Bandura (2001). Also included is Rogers's (1962, 1995) model known as the Diffusion of Innovation (DOV).

According to Prochaska and DiClemente (1983), TTM involves "10 processes of change receiving differential application during … five stages of change" (p. 391). These processes of change are: "consciousness raising, self-liberation, social liberation, self-reevaluation, environmental reevaluation, counterconditioning, stimulus control, reinforcement management, dramatic relief, and helping relationships" (p. 391).

This model, which sets forth the stages of change that human beings go through, provides the theoretical framework for the work of this study in changing behavior among African American men. The rationale for using Prochaska and DiClemente's model is to move study participants to the stage of action or maintenance by having them commit to annual medical exams that provide PSAs and digital rectal evaluations. The goal is to effect behavioral change that leads to a reduction in the mortality rates of African American men; increase their potential treatment options; encourage them to pursue annual medical reviews of their prostate health; and offer them a greater awareness, readiness, and utilization of the diagnostic options available to them. This should lead to their increased readiness to act on healthier behavior and to maintain the changes they make. To be explicit, this study conceptualizes four stages of change of behavior: (1) precontemplation, (2) contemplation, (3) action, and (4) maintenance of actions.

According to Prochaska and DiClemente (1983), one of the most important findings to emerge from their research "with self-changers and therapy changers" was that "particular processes of change tend to be used much more during particular stages of change" (p. 285). Their "initial data suggest[ed] that many individuals begin to contemplate changing particular aspects of their lives because of developmental processes that move them into a new stage in life" (p. 286). Based on the TTM they developed, the authors made a number of predictions about individuals in various stages of the change process. For example, "precontemplators" (whom the authors defined as individuals who are not aware of having problem, though others see them as having one) tend to "be defensive and avoid changing their thinking and behavior; while "contemplators, who are seriously thinking about changing their behavior … will be "most likely to use consciousness raising to gather further information" about the behavior they want to change (p. 391). On the other hand, since "subjects in the action stage are most committed to making behavioral changes," they would be likely to "use

self-liberation, counter-conditioning, stimulus control, and reinforcement management the most" (p. 391).

Overall, Prochaska and DiClemente (1983) concluded that their "research and model on self-change and therapy change clearly suggests that "both … verbal and behavioral … sets of processes appear to be vitally important for individuals to complete the course of change" (p. 285). Verbal processes, they concluded, "are most important in preparing clients for action, while the behavioral processes become more important once clients have committed themselves to act" (p. 285).

Bandura's (2001) concept of self-efficacy also guided the present study. "To be an agent," he wrote, "is to intentionally make things happen by one's actions.… The core features of agency enable people to play a part in their self-development, adaptation, and self-renewal with changing times" through the strength of belief in one's own ability" (p. 2). In short, according to Bandura (1997), "Self-efficacy determines the beliefs a person holds regarding his or her power to affect situations," and "none [of these mechanisms] is more central or pervasive than people's beliefs in their capability to exercise some measure of control over their own functioning and over environmental events" (p. 10).

In addition, Bandura (2001) wrote, "Having adopted an intention and an action plan, one cannot simply sit back and wait for the appropriate performances to appear. Agency thus involves not only the deliberative ability to make choices and action plans, but the ability to give shape to appropriate courses of action and to motivate and regulate their execution." These, he wrote, include the uses of self-monitoring, performance self-guidance via personal standards, and corrective self-reactions (Bandura 1986, 1991b).

Because this study utilizes an avatar and social media in its methodology, the work of Rogers (2004) is also relevant. Rogers described the diffusion of ideas as "the process through which an innovation, defined as an idea perceived as new, spreads via certain communication channels over time among the members of social system" (p. 13).

Accordingly, such innovations are applicable to “the recent spread of the Internet or to any new idea” (p. 13).

In expanding upon Rogers’s DOV theory, the Boston School of Public Health (BSPH) (2013) wrote that it

> originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system.
>
> The end result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product. Adoption means that a person does something differently than what they had previously (i.e., purchase or use a new product, acquire and perform a new behavior, etc.). The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible. (p. 1)

In addition, BSPH (2013) noted that “it is important to understand the characteristics of the target population that will help or hinder adoption of the innovation.” This advice was followed in developing the methods used to gather data for the current study.

Chapter III

METHODS

This chapter outlines the methods and procedures used in this study. This includes an overview of the study design and procedures, description of the study participants, and description of research instrumentation. The chapter also presents the treatment of data and data analysis plan.

IRB Approval

This study received approval for all study activities from the Teachers College, Columbia University Institutional Review Board (IRB) as Protocol #15-125 (see Appendix A for IRB Approval Letter) on December 12, 2014. It was not until IRB approval was attained that the study's data collection began in August/September 2015.

The Study Participants

This study recruited 41 African American men between the ages of 20 and 64 who were potentially at risk for prostate cancer, a complete description of the individuals who participated in this study is provided in chapter IV Part I, basic demographics. Participants were recruited to this via using a dual method. Firstly, advertisements were placed on various social media platforms, like Facebook and Twitter. The advertisement

that was placed on these websites had to be concise; the messages that solicited study participants was:

> Go to www.surveymonkey.com/s/AAProstateCancer/ to take a survey & rate a video for a chance to win a $300, $200, or $100 prize.

In addition to searching for study participants through the internet, the principal investigator also approached various entities in New York City, mostly within Harlem and the Bronx, where African American males frequent to see if these entities would assist the research in recruiting individuals into the study. The visited institutions included Harlem's local community board, the Schomburg Center for Research in Black Culture, the Congress on Racial Equality's (CORE) Bronx division, the NCAAP's Manhattan branch, the Bronx Public Library, local barber shops around Harlem and the Bronx, and the YMCA in Harlem. In each of these places, the appropriate administrative staff/employee/manager was contacted and the purpose of the study was explained as well as the need to recruit study participants.

These entities were asked to help recruit African American males to the study using in three different ways: (1) by posting the study flyer physically in their building, (2) by distributing the flyer to their clientele (many copies were provided to the solicited entity), or (3) by sending an email out on any listserv that they may have had (not all entities had listservs). The first two methods made use of the same study flyer, which is provided in appendix F. This flyer outlined the tasks involved in the study, including: taking a 30-minute online survey, watching the avatar e-health video over the internet, and then spending 10 minutes taking exit questionnaires. The flyer incentivized potential participants by placing interested parties into a lottery where they had a chance to win a $300, $200, or $100 Amazon gift card. Finally, a URL was provided to any interested individuals to find all of the study materials. The email messages that were sent to solicit study participants were drafted by the principal investigator; the email messages shares the same information as the study flyer and only the formatting is different. The e-mail

message that was sent out is included in Appendix E. Finally, the principal investigator also used personal connections and texted an invite to potentially interested participants; this text message is shown in Appendix G.

Participants recruited via the internet or through the personal outreach of the principal investigator were all directed to the same URL on survey monkey. Upon accessing the relevant page, an introduction to the study was provided and the extent of their involvement was explained. Everyone who accessed this URL was then prompted to complete a screening instrument, all of the study instruments (which are described in details below), watch the avatar e-health intervention, and then finish by taking an exit survey. Any participant that did not answer yes to all of these questions was excluded from participation in the study.

1) Are you an African American man who is age 18 or older?
Yes ___ No___

2) Are you able to read and understand English on a high school level?
Yes ___ No___

3) Are you able to devote about 45 minutes to this study at this time—for a 3 in 200 chance to win a $300, $200, or $100 gift certificate for use on www.Amazon.com?
Yes ___ No___

6) More specifically, are you willing to spend 30 minutes answering a survey?
Yes___ No____

7) Next, are you willing to watch an avatar video (cartoon) for about 5 minutes?
Yes___ No____

8) Are you willing to answer another set of questions for about 10 minutes, including rating the avatar videos and describing the impact on you?
Yes ___ No___

After a period of six months, 43 individuals had completed all parts of the study; two were then excluded for failing to meet the study requirements. Although the intent was to collect up to 200 responses, only 41 respondents who met the inclusion criteria participated in the study. A lack of response in a reasonable time frame is a common

challenge for many researchers. One limitation of the study participants is that New Yorkers were heavily over-sampled, thus limiting the ability of this study to generalize the results to the wider African American community of men in the United States.

Development of the E-Health Avatar Videos

Other study procedures involved the development of the 10-minute e-health avatar video (cartoon-like) that was developed using technology available from www.goanimate.com. First, scripts for the videos were created based on a review of research, literature, and scholarship on prostate cancer. Second, the scripts were reviewed and edited by the dissertation sponsor, Dr. Barbara Wallace. Third, the Principal Investigator created the avatar video using www.goanimate.com technology. Fourth, the dissertation sponsor reviewed and suggested edits. Fifth, after edits to the avatar videos were made and approved, an online focus group was held with a diverse group of video reviewers who included health educators, nurses, and medical doctors. This focus group provided feedback on strengths, weaknesses, and recommended changes to the 10-minute video. Sixth, a second online focus group with different people was held to receive a final round of additional feedback. Finally, the edited video was used as an e-health intervention in this study. One limitation of the intervention video was that it was made to be sensitive to African Americans that grew up in the US; thus, there may be other Blacks around the world that this e-health video would not connect with on a cultural level. One study participant, for example, identified as “Black Haitian.”

Description of the Study Instrumentation

This study used a new instrument entitled the **Survey for the African American Men’s Prostate Cancer Awareness Avatar Video Study**, which is based on both new

scales and prior scales used by fellows of the Research Group on Disparities in Health (RGDH). The new scales were based on a review of research, being created by the Principal Investigator and the dissertation sponsor, Dr. Barbara Wallace, Director of the RGDH. The prior scales were developed by Dr. Wallace and/or in collaboration with prior fellows of the RGDH. All scales composing the study instrument are described herein. In the findings section, means and standard deviations were reported for all continuous, discrete, and ordinal variables. Note that some of the items included an unsure/not available (NA) option. When calculating means and standard deviations of these items, these extra categories were omitted from the calculations.

Part I: Basic Demographics (BD-9)

The BD-9 is a demographics tool developed by Dr. Wallace and used by prior fellows of the RGDH (e.g., Tettey, 2010). However, the BD-9 also includes questions from a brief health survey that was also previously used by Tettey; this permits obtaining information on age, socioeconomic status, level of education, Body Mass Index (BMI)—including health insurance. It includes ratings on a 6-point Likert scale (i.e., 1=Excellent, 2=Very Good, 3=Good, 4=Fair, 5=Poor, 6=Very Poor) for weight, their health status, and the quality of their medical care. One note of caution must be made about the measurement of race, which is a difficult construct to operationalize given the complex ways that different individuals identify. As can be seen in Appendix D, the BD-9 did not distinguish between the different ways that Black males may identify in the US since the category was labeled simply as “Black / African American.” Thus, if an individual identified more narrowly as “Black Haitian,” then this respondent would be forced to select from the more general category that was provided.

Part II: Basic Health Survey (BHS-8)

The BHS-8 is a new scale based on review of research that was created for this study by the Principal Investigator and his dissertation sponsor, Dr. Wallace. The BHS-8

includes eight items that ask respondents to self-rate various aspects of their health, including the respondent's level of overall health, their height, weight, weight self-rating, overall quality of care received for medical condition, etc. The full scale can be seen in Appendix D.

Part III: Prostate Cancer Scale (PCS-10)

The PCS-10 is a new scale based on a review of research that was created for this study by the Principal Investigator and his dissertation sponsor, Dr. Wallace. The PCS-10 permits obtaining the prevalence of diagnoses of prostate cancer, history of screening for prostate cancer (i.e., with yes, no, or unsure options), as well as the prevalence of prostate cancer in their family and in their social network (i.e., check all that apply)—including deaths from prostate cancer and the metastasis of cancer in their network (i.e., number indicated).

Part IV: Scale Measuring Health Literacy via Skills and Self-Efficacy (SM-HL-V-S-SE-16)

The SM-HL-V-S-SE-16 is a new scale based on a review of research that was created for this study by the Principal Investigator and his dissertation sponsor, Dr. Wallace. Most helpful was how the CDC has defined health literacy, as follows: "The Patient Protection and Affordable Care Act of 2010, Title V, defines health literacy as the degree to which an individual has the capacity to obtain, communicate, process, and understand basic health information and services to make appropriate health decisions" (para. 1). Thus, items in the new scale reflect the various aspects of this definition. This new scale permits obtaining subjects' level of health literacy, as measured in terms of (1) relevant skills (8 self-ratings), and (2) self-efficacy (8 self-ratings) to perform them. A sample item, below, indicates how the self-ratings are made for skills and self-efficacy, respectively:

For being able to ask questions that will help me to better understand, or completely understand what a health professional has explained to me
13-I would rate my ability as

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

re14-And, I would rate my level of confidence for doing this as

Not confident					Extremely confident
0%	20%	40%	60%	80%	100%

Thus, the scale produces an ability/skills score that is based on 8 items, and a self-efficacy score that is based on 8 items. Internal consistency was obtained using Cronbach's Alpha for the health literacy ability/skills sub-scale, and for the healthy literacy self-efficacy sub-scale. Cronbach's Alpha was estimated to be .905 and .926 for the health literacy skills and self-efficacy scales, respectively.

Part V: Prostate Cancer Screening Empowerment Scale Measuring Stage of Change and Self-Efficacy for Four Behaviors—Pre-Video (PCS-ES-M-SOC-SE-PRE-V-4)

This is a new scale based on a review of research that was created for this study by the Principal Investigator and his dissertation sponsor, Dr. Wallace—while following the work of Garcia (2013). This new scale permits obtaining the subjects' stage of change and self-efficacy for (1) going to see a medical provider and getting a physical examination at least once a year, (2) making sure they receive a digital rectal examination to screen for prostate cancer, (3) making sure they receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening. For each of these four target behaviors of interest, subjects provide: (a) a rating for their stage of change (i.e., following the work of Prochaska & DiClemente, 1983, and their stages of precontemplation, contemplation, preparation, action and maintenance) for each of the four target behaviors; and (b) a rating of their self-efficacy (Bandura, 1977, 1997) or level of confidence for performing

each of the four target behaviors. A sample question with the (a) stage of change self-rating scale, and (b) self-efficacy rating scale is provided, below:

Subscale 3: Screening for Prostate Cancer Via a PSA Test
1.) When it comes to the behavior of ***making sure you receive what is called a PSA test to screen for prostate cancer***, check the following that most applies to you:
_____I am not thinking of doing this behavior at all.
_____I am thinking about doing this behavior.
_____I am preparing to do this behavior.
_____I have been doing this behavior for **less than six (6) months.**
_____I have been doing this behavior for **more than six (6) months.**
_____NA, I have prostate cancer—already know my status

2.) When it comes to the behavior of ***making sure you receive what is called a PSA test to screen for prostate cancer***,, how confident are you in performing this behavior:
____0% confident ____20% confident ____40% confident
____60% confident ____80% confident ____100% confident
____NA, I was born HIV positive—already know my status
____NA, I have prostate cancer—already know my status

The measure produced sub-scale scores for each of the four target behavior: i.e., a stage of change mean score for the sample, and a self-efficacy mean score for the sample. Internal consistency was .749 and .852 for the stage of change and self-effiacy pre-measures for the four target behaviors.

Part VI: Dose of Exposure to Video (DOE-TV-1)

This is a standard single-item tool used in prior studies conducted by fellows of the RGDH (e.g., Aiyedun, 2014) that was created by Dr. Wallace, Director of the RGDH. It permits determining dose of exposure to an avatar video, after respondents have been asked to watch it—as a link embedded in the survey for convenience. The question follows:

1) Please select one of the following:
- □ _____I watched none of the video
- □ _____I watched some of the video
- □ _____I watched most of the video
- □ _____I watched all of the video

Part VII: Rate the Video (RTV-1)

This is a standard single item tool used in prior studies conducted by fellows of the RGDH (e.g., Aiyedun, 2014) that was created by Dr. Wallace, Director of the RGDH. It permits ascertaining on a six-point Likert scale how subjects evaluate or rate the video in terms of the information shared. The single question follows:

1. In terms of the information shared in the video, how do you rate the video:

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

Part VIII: Prostate Cancer Screening Empowerment Scale Measuring Stage of Change and Self-Efficacy for Four Behaviors—Post-Video (PCS-ES-M-SOC-SE-POST-V-4)

This is the same scale as described as PART V, with the difference that PART V is administered pre-video viewing, while this PART VIII is administered post-video viewing. Hence, PART VIII permits determining, *after* watching the video, what is their stage of change and self-efficacy for (1) going to see a medical provider and getting a physical examination at least once a year, (2) making sure they receive a digital rectal examination to screen for prostate cancer, (3) making sure they receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening. Cronbach's Alpha was .852 and .862 for the stage of change and self-efficacy subscales for the prostate empowerment scale.

Part IX: Intention to Engage in Diffusion of the Innovation of Watching the Avatar Video (DIWV-2)

This is a standard two -item tool used in prior studies conducted by fellows of the RGDH (e.g., Aiyedun, 2014; Garcia, 2013) that was created by Dr. Wallace, Director of the RGDH. It permits ascertaining whether subjects intend to recommend the avatar video to others, while an answer of "yes" suggests diffusion of the innovation as per the theory of Rogers (1962, 1995). In addition, a second open-ended question permits obtaining qualitative data for thematic analysis, as follows: *Why would you recommend*

or not recommend the video cartoon to others? Please explain why or why not. What other comments do you have?

Quantitative Portion of Study

1. What are their demographic and background characteristics (e.g., age, socioeconomic status, level of education)?

   PART I: BASIC DEMOGRAPHICS (BD-9)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

2. What is their health status (e.g., Body Mass Index) and how do they rate their healthcare?

   PART II: BRIEF HEALTH SURVEY (BHS-8)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

3. What is the prevalence of diagnoses of prostate cancer, history of screening for prostate cancer, as well as the prevalence of prostate cancer in their family and in their social network—including deaths from prostate cancer and the metastasis of cancer?

   PART III: PROSTATE CANCER SCALE (PCS-10)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

4. What is their health literacy, as measured in terms of relevant skills and self-efficacy to perform them?

   PART IV: SCALE MEASURING HEALTH LITERACY VIA SKILLS AND SELF-EFFICACY (SM-HL-V-S-SE-16)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

5. What is their stage of change and self-efficacy for (1) going to see a medical provider and getting a physical examination at least once a year, (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, and (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer?

   PART V: PROSTATE CANCER SCREENING EMPOWERMENT SCALE MEASURING STAGE OF CHANGE AND SELF-EFFICACY FOR FOUR

BEHAVIORS—PRE-VIDEO (PCS-ES-M-SOC-SE-PRE-V-4)
Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

6. After watching an avatar (cartoon-like) video, what do they report as their dose of exposure to the video (i.e., watched none, some, most, or all of the video)?

   PART VI: DOSE OF EXPOSURE TO VIDEO (DOE-TV-1)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

7. How do they evaluate or rate the video in terms of the information shared?

   PART VII: RATE THE VIDEO (RTV-1)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

8. After watching the video, what is their stage of change and self-efficacy for (1) going to see a medical provider and getting a physical examination at least once a year, (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening?

   PART VIII: PROSTATE CANCER SCREENING EMPOWERMENT SCALE MEASURING STAGE OF CHANGE AND SELF-EFFICACY FOR FOUR BEHAVIORS—POST-VIDEO (PCS-ES-M-SOC-SE-POST-V-4)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

9. Did they move across stages of change from precontemplation or contemplation to preparation for any of the four target behaviors (i.e., (1) going to see a medical provider and getting a physical examination at least once a year, (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening?

   PART IX: MOVEMENTS IN STAGES OF CHANGE TO PERFORM THE FOUR TARGET BEHAVIORS
   Data Analysis Plan: Inferential statistics, specifically paired t-tests, comparing their pre-video viewing (PART V) to post-video viewing scores (PART VIII)

10. Did they experience an increase in self-efficacy or confidence to perform the four target behaviors from (i.e., (1) going to see a medical provider and getting a physical examination at least once a year, (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening) from before to after watching the videos?

    PART X: MOVEMENT IN SELF-EFFICACY TO PERFORM THE FOUR TARGET BEHAVIORS
    Data Analysis Plan: Inferential statistics, specifically paired t-tests, comparing their pre-video viewing (PART V) to post-video viewing scores (PART VIII)

11. Is there a significant relationship between selected demographics and other study scales with the study outcome variable/dependent variable of being in an action or maintenance stage for [# (3)] making sure they receive a PSA test to screen for prostate cancer—as measured before watching the video?

    PART X1: RELATIONSHIP BETWEEN DEOMGRAPHIC VARIABLES AND OTHER STUDY SCALES WITH THE TARGET BEHAVIOR OF GOING TO GET A PSA TEST TO SCREEN FOR PROSTATE CANCER (PRE-MEASURE)
    Data Analysis Plan: Inferential statistics, specifically Spearman correlations

12. What are the significant predictors of being in an action or maintenance stage for [# (3)] making sure they receive a PSA test to screen for prostate cancer—as measured before watching the video?

    PART XI1: PREDICTING THE TARGET BEHAVIOR OF GOING TO GET A PSA TEST TO SCREEN FOR PROSTATE CANCER (PRE-MEASURE)
    Data Analysis Plan: Multiple regression and backward stepwise regression analyses.

Mixed Methods Portion of Study

13. To what extent do they intend to diffuse the innovation of providing health education on prostate cancer via e-health in the form of an avatar video by either recommending or not recommending the video? And, what are their reasons for recommending or not recommending the avatar video, including any other comments they might have?

    PART XIII: INTENTION TO ENGAGE IN DIFFUSION OF THE INNOVATION OF WATCHING THE AVATAR VIDEO (DIWV-2)

Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages; and, the identification of emergent themes for the qualitative data

Data Analysis Plan

All data analysis in this study was executed with the use of the latest available version of SPSS. Descriptive statistics (mainly the means and standards deviations) and frequency tables were used to describe the distribution of the variables collected. Spearman's correlation coefficient was used to check for a significant relationship between the behavior of going to get a PSA exam and other variables in this study since this behavior was measured on an ordinal scale. For research questions 9 and 10 that considered movements in the stages of change for the participants' behavior and self-efficacy respectively, paired t-tests were used to test for statistically significant differences between the study's pre- and post-measures of the four target behaviors. Pairwise deletion was used and Levene's test was used to check for the assumption of homogeneity of variance; no violations of this assumption were detected. Cohen's *d*, which is an effect size measure that is also referred to as the standardized mean difference, is used in combination with these paired t-tests to measure the magnitude of effect. Regression models were used in two parts of this study. The regression analyses all tested for normality of errors and homoscedasticity using graphical methods and no major violations were detected; listwise deletion was used. The first series of regression models was used to answer research question 12, were the dependent variable was the behavior of going to get a PSA exam to screen for prostate cancer. This same dependent variable was then regressed on different independent variables in simple linear regression models to test the hypotheses listed in the anticipated findings from data analysis section. In both sets of regression analyses, a backward stepwise regression was also carried that included all variables both sets of analyses.

Anticipated Findings from Data Analysis

It is anticipated that the significant predictors of being in an action or maintenance stage for [# (3)] making sure they receive a PSA test to screen for prostate cancer—as measured before watching the video, are the following independent variables:

- Higher level of education
- Higher socioeconomic status
- Lower Body Mass Index (BMI)
- Higher health literacy skills and self-efficacy
- Higher pre-video viewing self-efficacy for (1) going to see a medical provider and getting a physical examination at least once a year, (2) making sure they receive a digital rectal examination to screen for prostate cancer, (3) making sure they receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening

Conclusion

This chapter described in detail the methods used in the present study. This included an overview of the study design, study procedures, recruitment of participants, description of the study participants, and description of research instrumentation. The chapter concluded with how data were managed and analyzed.

Chapter IV describes in detail the results of the study and follow the data analysis plan outline in this chapter.

Chapter IV

FINDINGS

In accordance with the data analysis plan, this chapter presents the results of the survey questions that were used to collect data from the 41 participants who comprised this convenience sample. Text and tables are organized by the questions asked in each part of the survey.

Part I: Basic Demographics (BD-9)

As Table 1 shows, Black/African American men, who are the research focus of this study, comprised 40 (97.6%) of its 41 African American participants (Q.12). The remaining individual identified himself as mixed race. Ages for the entire sample group (Q.10) ranged from 20-64; 22% (n=9) were in the 56-65 age range, followed by 19.5% (n=8) in both the 51-55 and the 26-30 age categories (M=43.68, SD=13.00). Table 1 also presents the relationship status (Q.11) of the survey takers: 31.7% (n=13) were married, 22.0% (n=9) had never married, 12.2% (n=5) were divorced, 9.8% (n=4) were in a committed relationship, 4.9% (n=2) of participants lived with a significant other, 2.4% were dating; the remaining five (12.2%) selected Other. Over eighty percent (80.5%, n=33) of the participants were born in the U.S.; eight (19.5%) were born elsewhere (Q.15). Table 1 also shows (Q.18) that 36.6% (n=15) of the 41 participants had a Doctoral degree, and the remaining five (12.5%) had earned a GED or Associate degree (M=16.63, Median=16, SD=2.91). Finally, Table 1 shows participants' household income

Table 1. Basic Demographics of Participants (N=41)

	N	%
(Q.12) ***Race/Ethnicity***		
1. Black/African American	40	97.6
2. Mixed	1	2.4
(Q.10) ***Age***		
(M=43.68, SD=13.00)		
20-25	3	7.3
26-30	8	19.5
31-35	3	7.3
36-40	2	4.9
41-45	3	7.3
46-50	5	12.2
51-55	8	19.5
56-65	9	22.0
(Q.11) ***Relationship Status***		
Married	13	31.7
Divorced	5	12.2
Separated	1	2.4
Never Married	9	22.0
Living with Significant Other	2	4.9
In a Committed Relationship	4	9.8
Currently Dating	2	2.4
Other	5	12.2
(Q.15) ***U.S. Born***		
1. Yes	33	80.5
2. No	8	19.5
(Q.17) ***Income***		
(M=$118,048.45, Median=$74,999.50, SD=$152,626.25)		
1. Less than $10,000	3	7.3
2. $10,000-$19,000	2	4.9
3. $20,000-$39,000	4	9.8
4. $40,000-$49,000	4	9.8
5. $50,000-$99,999	14	34.1
6. $100,000-$199,999	10	24.4
7. $200,000-$299,000	2	4.9
8. $300,000-$399,999	0	0.0
9. $400,000-$499,999	0	0.0
10. $500,000-$799,999	1	2.4
11. More than $800,000	1	2.4

Table 1 (continued)

	N	%
(Q.18) ***Highest Level of Education (M=16.63, Median=16, SD=2.91)***		
12. 12th Grade/GED	5	12.5
14. Associate Degree	5	12.5
16. Bachelor's Degree	15	36.6
18. Master's Degree	10	24.4
22. Doctoral Degree	6	14.6
(Q.19) ***Employment Status***		
Part-time Undergraduate	1	2.4
Full-time Undergraduate	1	2.4
Part-time Graduate	1	2.4
Full-time Graduate	4	9.8
Employed Part-time	3	7.3
Employed Full-time	24	58.5
Unemployed	6	14.6
Receiving SSI/SSD	2	4.9
Receiving Welfare	0	0.0
Other	3	7.3

(Q.17) and employment status (Q.19). Ten (34.1%) of the participants reported that their household income was $50,000-$99,000, and another 24.4% (n=10) reported theirs as $100,000-$199,999. Two (4.9%) participants selected the $200,000-$299,000 category; a total of 13 reported incomes below $50,000, and one reported that his income was over $800,000 (M=$118,048.45, Median=$74,999.50, SD=$152,626.25).[1] As to their employment status, over half (58.5%, n=24) of the participants were employed full-time, followed by 14.6% (n=6) who were unemployed, and 9.8% (n=4) who were full-time graduate students. None of the study participants were receiving welfare. Note that the response options to Q.19 were not mutually exclusive since respondents could select

[1] Since participant income was measured using an ordinal scale as shown in Table 1, the mean and standard deviation was calculated by using the midpoint of each response option. For example, the midpoint of the response option $10,000-$19,000 was $14,500 and for $20,000-$39,000 was $29,500.

multiple options to describe their employment status. As a result, the frequency percentages for Q.19 do not sum up to 100%.

Part II: Brief Health Survey (BHS-8)

Table 2 presents participants' responses to the questions in Part II of the survey, which addressed their health and provider care. When asked how they rated their overall health (Q.20), 39% (n=16) of the respondents rated it as Good, followed closely by 36.6% (n=15) who rated theirs as Very Good; another 19.5% (n=8) considered theirs Excellent, and 4.9% (n=2) described theirs as Fair (M=4.71, SD=.84). Body Mass Index (BMI) was calculated from height (Q.21) and weight (Q.22) and ranged between 21.77 and 39.99. For BMI, the 25-30 range is usually considered overweight while 30+ is widely considered indicative of obesity (CDC, 2017). Going off of these cutoffs, there were 11 study participants who were in the normal range (26.8%), 15 in the overweight category (36.6%), and14 in the obese category (34.1%) (M=28.45, SD=4.72). Asked to self-rate their weight (Q.23), 58.5% (n=24) characterized themselves as Normal; another 36.6% (n=15) considered themselves Overweight, and 4.9% (n=2) considered themselves Obese (M=2.46, SD=.60). In response to Question 24, whether/what kind of medical insurance they had, 73.2% (n=30) of participants responded that they had a private insurance plan, followed by 12.2% (n=5) who had Medicaid, 2.4% (n=1) who had Medicare, and 4.9% (n=2) who had an HMO; 12.2% (n=5) responded that this question did not apply to them.

Table 2. Brief Health Survey (N=41)	*N*	%
(Q.20) ***Overall Health***		
(M=4.71, SD=.84)		
1. Very Poor	0	0
2. Poor	0	0
3. Fair	2	4.9
4. Good	16	39.0
5. Very Good	15	36.6
6. Excellent	8	19.5
(Q.21/22) ***BMI***		
(M=28.45, SD=4.72)		
20-24.99	11	26.8
25-29.99	15	36.6
30-34.99	11	26.8
35-39.99	3	7.3
(Q.23) ***Weight Self-Rating***		
(M=2.46, SD=.60)		
1. Underweight	0	0
2. Normal	24	58.5
3. Overweight	15	36.6
4. Obese	2	4.9
(Q.24) ***Medical Insurance***		
Private Insurance Plan	30	73.2
HMO	2	4.9
Medicaid	5	12.2
Medicare	1	2.4
Not Applicable	5	12.2
(Q.25) ***Overall Quality of Health Care***		
(M=4.78, SD=.83)		
1. Very Poor	0	0
2. Poor	0	0
3. Fair	3	7.3
4. Good	10	24.4
5. Very Good	20	48.8
6. Excellent	7	17.1
7. N/A	1	2.4

Table 2 (continued)	*N*	%
(Q.26) ***Overall Quality of Care from Primary Provider (M=4.68, SD=.86)***		
1. Very Poor	0	0
2. Poor	0	0
3. Fair	4	9.8
4. Good	11	26.8
5. Very Good	19	46.3
6. Excellent	6	14.6
7. N/A	1	2.4
(Q.27) ***Sensitivity / Competence of Primary Provider (M=4.55, SD=1.09)***		
1. Very Poor	0	0
2. Poor	1	2.4
3. Fair	7	17.1
4. Good	9	22.0
5. Very Good	15	36.6
6. Excellent	8	19.5
7. N/A (I do not receive any health care)	1	2.4

Note that respondents were given the chance to select multiple categories in response to Q.24, so these responses were not mutually exclusive. In addition, seven participants (17.1%) rated the overall quality of the healthcare they receive (Q.25) as Excellent, 20 (48.8%) rated theirs as Very Good; ten (24.4%) rated theirs as Good, and three (7.3%) characterized their healthcare as Fair (M=4.78, SD=.83). A single respondent said the question was not applicable. Table 2 also shows how this sample of men rated the overall quality of care they receive from their primary healthcare provider (Q.26): Nineteen (46.3%) rated this care as Very Good, followed by 11 (26.8%) who rated theirs as Good. Six (14.6%) rated theirs as Excellent, and another four (9.8%) rated theirs as only Fair. One participant responded that the question did not apply to him (M=4.68, SD=.86). Finally, Table 2 shows how study participants rated the sensitivity and competence of their providers in treating them as an African American (Q.27): Fifteen (36.6%) participants selected the Very Good category, nine (22.0%) selected

Good, and eight (19.5%) selected Excellent; the remaining seven (17.1%) chose Fair (M=4.55, SD=1.09).

Part III: Prostate Cancer Scale (PCS-10)

Tables 3 and 4 present more detailed information on the health status of participants (Table 3) and their families (Table 4), specifically in relation to PC (Q.28-40). Participants were first asked about themselves. In response to Question 28, how many had been told by their physician that they had PC, 37 (90.2%) of the 41 participants responded that they did not have PC; the other four (9.8%) did (M=1.10, SD=.30). Table 3 also shows how many participants had been told by their physician that they were at risk for PC (Q.29). Thirty-two (78%) did not have this risk, eight (19.5%) had been told that they did, and one participant was unsure (M=1.24, SD=.49). When asked (Q.30) if they had had a digital rectal exam, 14 (34.1%) responded negatively, while 27 (65.9%), responded positively (M=1.66, SD=.48). Question 31 asked participants if they had ever been told by a medical provider that they were going to have their PSA measured, to which 25 (61%) participants said no, 14 (34.1%) said yes, and 2 (4.9%) were not sure (M=1.44, SD=.59). To Question 32, whether participants they had ever been told by a medical provider that they were being given a screening test for PC, 27 (65.9%) said they had not, while 13 (31.7%) participants said yes (M=1.37, SD.54). The survey then asked about participants' family history of PC (Q.33-40). In response to Question 33, 29 respondents (70.7%) said they did not know of a family member who was diagnosed with PC, while nine (22.0%) did know such a family member, and three (7.3%) were unsure (M=1.37, Min 1, Max 3, SD=.62).

Table 3. Prostate Cancer Scale (PCS-10) (N=41)	*N*	%
*(Q.*28) ***Told by physician has PC***		
(M=1.10, SD=.30)		
1. No	37	90.2
2. Yes	4	9.8
*(Q.*29) ***Told by physician at risk for PC***		
(M=1.24, SD=.49)		
1. No	32	78.0
2. Yes	8	19.5
3. Unsure	1	2.4
(Q.30) ***Had digital rectal exam***		
(M=1.66, SD=.48)		
1. No	14	34.1
2. Yes	27	65.9
(Q.31) ***Going to have PSA measured***		
(M=1.44, SD=.59)		
1. No	25	61.0
2. Yes	14	34.1
3. Unsure	2	4.9
(Q.32) ***Told being given a screening test for PC***		
(M=1.37, SD=.54)		
1. No	27	65.9
2. Yes	13	31.7
3. Unsure	1	2.4
(Q.33) ***Family member diagnosed with PC***		
(M=1.37, Min 1, Max 3, SD=.62)		
1. No	29	70.7
2. Yes	9	22.0
3. Unsure	3	7.3

The respondents who replied affirmatively to Question 33 were then asked Questions 34-40 (Table 4), which focused on the health status of their families in relation to PC. Of the participants whose family members did have PC (Q.34), three cases (7.3%) were participants' fathers, followed by 4.9% (n=2) in uncles on the mother's side, and 2.4% each (n=1) from the maternal grandfather, paternal grandfather, and brother. Then asked (Q.35) whether they knew of a family member who had *died* of PC, 33 (80.5%) participants did not know anyone, while three (7.3%) did know someone and five

(12.2%) were unsure (M=1.32, SD=.69). Those who responded positively to Question 35 (n=4) were then asked (Q.36) which family member had died from PC. One each of those four men replied paternal grandfather, uncle mother's side, grandfather, and father. On the other hand, 16 (39%) participants did not know *anyone* diagnosed with PC (Q.37), while 61% (n=25) did know someone (M=1.61, SD=.49). Those who answered yes to Question 37 (n=25) were then asked whether they knew anyone who had *died* of PC, and if so, how many people (Q.38). Eight (19.5%) participants replied that they knew one person, seven (17.1%) said that they knew two men who had died of PC, and six (14.6%) participants replied that they knew four men who had died of PC. One participant knew three men who had died of prostate cancer, one knew five, and one knew six, and one knew seven or more (M=1.73, SD=1.95). Asked (Q.39) whether they knew anyone who had died of PC that had *metastasized*, 28 (68.3%) participants replied that they did not, while 11 (26.8%) did know someone; two participants (4.9%) were unsure (M=1.37, SD=.58). Those who answered yes to Question 39 (n=11), were then asked how many people they knew who had died from PC metastasis (Q.40). Ten (24.4%) participants indicated that they knew one person while one respondent said they knew who people who had died from PC (2.4%) (M=1.09, SD=.30).

Table 4. Health Status of Participants' Families (N=41)	*N*	%
(Q.34) ***If yes, family member diagnosed with PC (N=9)***		
1. Maternal Grandfather	1	2.4
2. Paternal Grandfather	1	2.4
3. Father	3	7.3
4. Uncle Mother's side	2	4.9
12. Brother	1	2.4
14. Other (Father In-law)	1	2.4
(Q.35) ***Know family member who died of PC (M=1.32, SD=.69)***		
1. No	33	80.5
2. Yes	3	7.3
3. Unsure	5	12.2

Table 4 (continued)

(Q.36) ***If yes, family member who died of PC (N=4)***	*N*	*%*
2. Paternal Grandfather	1	2.4
4. Uncle Mother's side	1	2.4
13. Other - Grandfather	1	2.4
13. Other - Father	1	2.4
(Q.37) ***Know someone diagnosed with PC (M=1.61, SD=.49)***		
1. No	16	39.0
2. Yes	25	61.0
(Q.38) ***If yes, number of people who died of PC (N=25) (M=1.73, SD=1.95)***		
1	8	19.5
2	7	17.1
3	1	2.4
4	6	14.6
5	1	2.4
6	1	2.4
7 or more	1	2.4
(Q.39) ***Know someone who died from PC metastasis (M=1.37, SD=.58)***		
1. No	28	68.3
2. Yes	11	26.8
3. Unsure	2	4.9
(Q.40) ***If yes, how many people died from PC metastasis (N=11; M=1.09, SD=.30)***		
1	10	24.4
2	1	2.4

Part IV: Scale Measuring Health Literacy via Skills and Self-Efficacy (SM-HL-V-S-SE-16)

Tables 5-9 show the data obtained from Part IV of the survey (Q.41-56). Table 5 shows how participants rated their *ability* to perform certain behaviors and their *confidence* level in performing those behaviors (Q.41-44). Table 6 shows participants' responses to questions about thinking about and understanding what they are told by a

Table 5. Seeking Out Health Information/Services (N=41)	*N*	%
(Q.41) ***For seeking out health information, I rate my ability as: (M=4.8, SD=1.03)***		
1. Very Poor	0	0
2. Poor	1	2.4
3. Fair	4	9.8
4. Good	8	19.5
5. Very Good	17	41.5
6. Excellent	11	26.8
(Q.42) ***For seeking out health information, I rate my confidence as: (M=79%, SD=23.2)***		
0%	0	0
20%	2	4.9
40%	4	9.8
60%	4	9.8
80%	15	36.6
100% Extremely Confident	16	39.0
(Q.43) ***For seeking out health services, I rate my ability as: (M=4.85, SD=1.11)***		
1. Very Poor	0	0
2. Poor	2	4.9
3. Fair	3	7.3
4. Good	7	17.1
5. Very Good	16	39.0
6. Excellent	13	31.7
(Q.44) ***For seeking out health services, I rate my confidence as: (M=79%, SD=21.2)***		
0%	0	0
20%	1	2.4
40%	5	12.22
60%	3	7.3
80%	19	46.3
100% Extremely Confident	13	31.7

health professional (Q.45-48). Table 7 indicates how well they believe that they really understand what they are told by a health professional, are able to communicate and make decisions about it, and ask questions that will help them to better understand (Q.49-56). For each behavior, participants were asked to rate (1) their ability, and (2) their confidence level.

Asked how they rated their ability to seek out health *information* (Q.41), 41.5% (n=17) of respondents rated their ability to do this as Very Good, followed by 26.8% (n=11) who rated their ability as Excellent, and 19.5% (n=8) who rated theirs as Good (M=4.8, SD=1.03). Then asked to rate their *confidence level* in performing this behavior (Q.42), 39.0% (n=16) rated themselves as Extremely Confident, and 36.6% (n=15) replied that they were 80% Confident; of the remaining 10 respondents, four each chose the 60% and 40% Confident categories (M=79%, SD=23.2). For seeking out health *services* (Q.43), 39.0% (n=16) participants considered their ability as Very Good, and 31.7% (n=13) considered theirs Excellent (M=4.85, SD=1.11). Asked how confident they were in performing this behavior (Q.44), 46.3% (n=19) rated themselves 80% confident, and 31.7% (n=13) responded that they were 100%, or Extremely Confident, and 12.22% (n=5) selected the 40% category (M=70%, SD=21.2).

Table 6 (Q.45-48) indicates similar results to those seen in Table 5. In response to Question 45, 19 (46.3%) participants rated their ability to communicate and ask questions about their health as Very Good, followed by 11 (26.8%) who rated theirs as Excellent, and 7 (17.1%) who rated theirs as Good (M=4.83, SD=3.23) (Q.45). Similarly, in answer to Question 46, 17 (41.5%) rated their confidence in communicating and asking questions about their health at 80% and 14 (34.1%) rated theirs at 100% (Extremely Confident) (M=79%, SD=22.5). For thinking about and understanding what they were told by a doctor (Q.47), 43.9% (n=18) rated their ability as Very Good, followed by 24.4% (n=10) as Excellent and 22% (n=9) as Good (M=4.80, SD=3.10). Rating the level of their *confidence* in thinking about and understanding what they were told by a health provider (Q.48) yielded similar results: 41.5% (n=17) rated their confidence level as 80%, 29.3% (n=12) rated theirs as 100%, and 22.0% (n=9) rated theirs at 60% (M=79%, SD=18.1).

Table 6. Thinking about, Asking, and Understanding Health Communications (N=41)	*N*	%
(Q.45) ***For communicating and asking questions about my health, I rate my ability as:***		
(M=4.83, SD=3.23)		
1. Very Poor	1	2.4
2. Poor	1	2.4
3. Fair	2	4.9
4. Good	7	17.1
5. Very Good	19	46.3
6. Excellent	11	26.8
(Q.46) ***For communicating and asking questions about my health, I rate my confidence as:***		
(M=79%, SD=22.5)		
0%	0	0
20%	3	7.3
40%	1	2.4
60%	6	14.6
80%	17	41.5
100% Extremely Confident	14	34.1
(Q.47) ***For thinking about, understanding what I was told by a health provider, I rate my ability as:***		
(M=4.80, SD=3.10)		
1. Very Poor	0	0
2. Poor	1	2.4
3. Fair	3	7.3
4. Good	9	22.0
5. Very Good	18	43.9
6. Excellent	10	24.4
(Q.48) ***For thinking about, understanding what I was told by a health provider, I rate my confidence as:***		
(M= 79%, SD=18.1)		
0%	0	0
20%	0	0
40%	3	7.3
60%	9	22.0
80%	17	41.5
100% Extremely Confident	12	29.3

Table 7 (Q.49-50) indicates how well participants believed that they really understand what they are told by a health professional, are able to communicate and make decisions about it, and ask questions that will help them to better understand. Nearly half (43.9%, n=18) of the 41 men rated their *ability* to truly understand what they were told by a health professional (Q.49) as Very Good, while 31.7% (n=13) considered themselves Excellent at this, and 22.0% (n=9) rated their ability as Good (M=5.05, SD=.81). Similarly, 43.9% (n=18) rated their *confidence* in this (Q.50) as 80%, with 36.6% (n=15) as 100% (Extremely Confident), followed by 17.1% (n=7) who rated their confidence level as 60% (M=83%, SD=15.8).

Table 7. Really Understanding Healthcare Provider (N=41)	N	%
(Q.49) ***For really understanding what I was told by a health provider, I rate my ability as:*** ***(M=5.05, SD=.81)***		
1. Very Poor	0	0
2. Poor	0	0
3. Fair	1	2.4
4. Good	9	22.0
5. Very Good	18	43.9
6. Excellent	13	31.7
(Q.50) ***For really understanding what I was told by a health provider, I rate my confidence as:*** ***(M=83% SD=15.8)***		
0%	0	0
20%	0	0
40%	1	2.4
60%	7	17.1
80%	18	43.9
100% Extremely Confident	15	36.6

Table 8 shows how well participants thought they memorized and were able to repeat out loud what they had been told by a health provider, as well as how good they thought they were at asking questions about their health (Q.51-54). Nearly half (43.9%, n=18) rated their ability to memorize and repeat what they had been told (Q.51) as Very Good, while 29.3% (n=12) rated theirs as Good and 19.5% (n=8) rated theirs as Excellent

(M=4.76, SD=.86). Similarly, 48.8% (n=20) of participants rated their *confidence* level in this behavior (Q.52) at 80%, while 26.8% (n=11) rated theirs at 100% (Extremely Confident) (M=79%, SD=17.3). For their ability to ask questions that would help them to better or completely understand what a health professional explained to them (Q.53), 46.3% (n=19) of participants rated their ability as Very Good, higher than the 26.8% (n=11) each for Good and Excellent (M=5.00, SD=.74); and for their confidence in doing this (Q.54), 46.3% (n=19) rated their confidence level at 80%, and 26.8% (n=11) rated theirs as 100% and, equally, at 40% (M=80%, SD=14.8).

Table 8. Memorizing, Repeating, Asking a Healthcare Provider

(N=41)	*N*	%
(Q.51) ***For being able to memorize and repeat out loud what I was told by a health provider, I rate my ability as:*** ***(M=4.76, SD=.86)***		
1. Very Poor	0	0
2. Poor	0	0
3. Fair	3	7.3
4. Good	12	29.3
5. Very Good	18	43.9
6. Excellent	8	19.5
(Q.52) ***For being able to memorize and repeat out loud what I was told by a health provider, I rate my confidence as:*** ***(M= 79%, SD=17.3)***		
0%	0	0
20%	0	0
40%	3	7.3
60%	7	17.1
80%	20	48.8
100% Extremely Confident	11	26.8
(Q.53) ***For being able to ask questions that will help me understand what a health provider explained to me, I rate my ability as:*** ***(M=5.00, SD=.74)***		
1. Very Poor	0	0
2. Poor	0	0
3. Fair	0	0
4. Good	11	26.8
5. Very Good	19	46.3
6. Excellent	11	26.8

Table 8 (continued)

	N	*%*
(Q.54) ***For being able to ask questions that will help me understand what a health provider explained to me, I rate my confidence as:*** ***(M=80%, SD=14.8)***		
0%	0	0
20%	0	0
40%	0	0
60%	11	26.8
80%	19	46.3
100% Extremely Confident	11	26.8

Table 9 shows participants' self-reported *ability* to make the best health decisions for themselves, take the best health-related actions, and tell a health professional what they decided to do, needed to do, or preferred to do (Q.55-56). In response to Question 55, 19 (46.3%) of participants rated their ability as Very Good, 11 (26.8%) rated theirs as Excellent, nine (22%) considered their ability as Good, and two (4.9%) thought they were only Fair (M=4.95, SD=.84). Question 56 asked the men to evaluate their *confidence* in the answers they gave to Question 55. Eighteen (43.9%) rated themselves as 80% confident, and 13 (31.7%) considered themselves 100% confident (M=80%, SD=17.0).

Table 9. Health Decisions and Actions (N=41)	*N*	%
(Q.55) ***For making the best health decisions for myself, deciding what actions I should take, I would rate my ability as:*** ***(M=4.95, SD=.84)***		
1. Very Poor	0	0
2. Poor	0	0
3. Fair	2	4.9
4. Good	9	22.0
5. Very Good	19	46.3
6. Excellent	11	26.8

Table 9 (continued)

	N	*%*
(Q.56) ***For deciding what actions I should take, and telling a health professional what I have decided to do, need to do, or prefer to do, I would rate my confidence as: (M=80%, SD=17.0)***		
0%	0	0
20%	0	0
40%	2	4.9
60%	8	19.5
80%	18	43.9
100% Extremely Confident	13	31.7

Part V: Prostate Cancer Screening Empowerment Scale Measuring Stage of Change and Self-efficacy for Four Behaviors—Pre-video (PCS-ES-M-SOC-SE-PRE-V-4)

Tables 10-12 present results from Questions 57-64 of the survey, which measured stages of change and self-efficacy in the men *before* watching the video. Table 10 shows the answers to Questions (Q.57-60). Question 57 asked participants about their behavior and their confidence in going to see a medical provider and getting a physical examination at least once a year. To this question, 23 men (56.1%) responded positively to the more-than-6-months option, followed by nine men (22.0%) who were thinking about it (M=3.93, SD=1.35). Question 58 followed up by asking participants to rate their confidence level in performing this behavior. Twenty-two (53.7%) men selected 100% (Extremely Confident), while 10 (24.4%) responded that they were 80% confident, and another 7 (17.1%) participants rated their confidence level at 60% (M=85%, SD=19.9). Question 59 asked participants about their behavior in discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer. In response, 13 (31.7%) participants selected the “more than 6 months” category, while seven (17.1%) responded that they were thinking about it, and six (14.6%) selected each of the following categories: Not thinking about it, Preparing to, and Less than 6 months (M=3.59, SD=1.70). Question 60 rated participants’ confidence level in

performing the behavior described in Question 59. Thirteen (31.7%) participants responded that they were 100% confident, eight (19.5%) each selected the 80% and 60% confident categories, five (12.2%) chose the 20% confident category; and the others were split among the remaining categories (M=67%, SD=33.2).

Table 10. Going to Medical Provider for Physical (N=41)	*N*	%
(Q.57) ***When it comes to the behavior of going to see a medical provider and getting a physical exam at least once a year, check the following that most applies to you:*** ***(M=3.93, SD=1.35)***		
1. Not thinking about doing this	1	2.4
2. Thinking about doing this	9	22.0
3. Preparing to do this	5	12.2
4. Less than 6 months	3	7.3
5. More than 6 months	23	56.1
(Q.58) ***When it comes to the behavior of going to see a medical provider and getting a physical exam at least once a year, HOW CONFIDENT ARE YOU in performing this behavior:*** ***(M=85%, SD=19.9)***		
1. 0%	0	0
2. 20%	1	2.4
3. 40%	1	2.4
4. 60%	7	17.1
5. 80%	10	24.4
6. 100% Extremely Confident	22	53.7
(Q.59) ***When it comes to the behavior of discussing with your medical provider whether you should receive a digital rectal exam to screen for PC, check the following that most applies to you:*** ***(M=3.34, SD=1.51)***		
1.Not thinking about doing this	6	14.6
2. Thinking about doing this	7	17.1
3. Preparing to do this	6	14.6
4. Less than 6 months	6	14.6
5. More than 6 months	13	31.7
6. N/A: I have PC and already know my status	1	2.4
7. N/A: I have had PC previously	2	4.9

Table 10 (continued)

(Q.60) ***When it comes to the behavior of discussing with your medical provider about whether you should receive a digital rectal examination to screen for prostate cancer, <u>HOW CONFIDENT ARE YOU</u> in performing this behavior:*** ***(M=67%, SD=33.2)***	*N*	*%*
1. 0%	3	7.3
2. 20%	5	12.2
3. 40%	2	4.9
4. 60%	8	19.5
5. 80%	8	19.5
6. 100% Extremely Confident	13	31.7
7. N/A: I have PC and already know my status	1	2.4
8. N/A: I have had PC previously	1	2.4

Table 11 covers participants' responses to questions about PSA testing (Q.61-62). The responses to Question 61 were relatively spread out: eight (19.5%) men were not thinking about discussing PSAs with their doctor, nine (22.0%) were thinking about it, nine (22.0%) were preparing to, five (12.2%) selected "less than 6 months," and nine (22.0%) selected "more than 6 months"; the remaining respondent had already had prostate cancer (M=3.05, SD=1.56). Question 62 rated the men's *confidence* level in discussing with their medical provider whether they should receive a PSA test, to which the responses were more clustered: 14 (34.1%) characterized themselves 100% Confident, and 12 (29.3%) rated their confidence at 80% (M=74%, SD=27.7).

Table 11. Discussing PSA Testing with Medical Provider (N=41)	*N*	%
(Q.61) ***When it comes to the behavior of discussing with your medical provider whether you should receive a PSA test to screen for PC, check the following that most applies to you: (M=2.95, SD=1.45)***		
1. Not thinking about doing this	8	19.5
2. Thinking about doing this	9	22.0
3. Preparing to do this	9	22.0
4. Have been doing this for less than 6 months	5	12.2
5. Have been doing this for more than 6 months	9	22.0
6. N/A: I have had PC previously	1	2.4
(Q.62) ***When it comes to the behavior of discussing with your medical provider about whether you should receive a PSA test to screen for PC, HOW CONFIDENT ARE YOU in performing this behavior: (M=74%, SD=27.7)***		
0%	1	2.4
20%	3	7.3
40%	4	9.8
60%	6	14.6
80%	12	29.3
100% Extremely Confident	14	34.1
N/A: I have had PC previously	1	2.4

Table 12 shows participants' self-reported behavior and confidence in relation to spreading awareness among other African American men about the need for PC screening. In response to Question 63, nine (22.0%) participants said they were not thinking about it, 11 (26.8%) said they were thinking about it, 13 (31.7%) said they were preparing to, and seven (17.1%) selected the more-than-6-months category (M=2.66, SD=1.33). Question 64 rated participants' confidence in performing the behavior described in Question 63. In response, 12 (29.3%) rated their confidence at 80%, while 11 (26.8%) scored themselves as 100% confident. These were followed by nine (22.0%) who selected the 60% confident category and five (12.2%) who placed their confidence at 40% (M=69%, SD=29.0).

Table 12. Behavior of Spreading Awareness (N=41)	*N*	%
(Q. 63) ***When it comes to the behavior of spreading awareness among other African American men about the need for PC screening, check the following that most applies to you: (M=2.66, SD=1.33)***		
1.Not thinking about doing this	9	22.0
2.Thinking about doing this	11	26.8
3.Preparing to do this	13	31.7
4.Have been doing this for less than 6 months	1	2.4
5.Have been doing this for more than 6 months	7	17.1
(Q. 64) ***When it comes to the behavior of spreading awareness among other African American men about the need for prostate cancer screening, <u>HOW CONFIDENT ARE YOU</u> in performing this behavior: (M=69%, SD=29.0)***		
0%	3	7.3
20%	1	2.4
40%	5	12.2
60%	9	22.0
80%	12	29.3
100% Extremely Confident	11	26.8

Part VI: Dose of Exposure to Video (DOE-TV-1)

Asked how much of the Avatar video they had watched (Q.65), the participants responded as shown in Table 13 below: 35 (85.4%) said they watched the entire video, while six (14.6%) said that they watched most of it. No one replied that they had watched less than that (M=3.85, SD=.36).

Table 13. Amount of Exposure to Video (N=41)	*N*	%
(Q.65) ***Watched how much of video: (M=3.85, SD=.36)***		
1. None	0	0
2. Some	0	0
3. Most	6	14.6
4. All	35	85.4

Part VII: Rate the Video (RTV-1)

After watching the video, participants were asked to rate the information presented in it (Q.66). Table 14 below shows that 17 (41.5%) of the 41 men rated the information as Excellent, while 15 (36.6%) rated it as Very Good, and six (14.6%) rated it Good. Three (7.3%) others rated it as only Fair; no one rated it less than Fair (M=5.12, SD=.93).

Table 14. Rate the Video (N=41)	*N*	%
(Q.66) **Rate *information shared in the video***		
(M=5.12, SD=.93)		
1. Very poor	0	0
2. Poor	0	0
3. Fair	3	7.3
4. Good	6	14.6
5. Very good	15	36.6
6. Excellent	17	41.5

Part VIII: Prostate Cancer Screening Empowerment Scale Measuring Stage of Change and Self-efficacy for Four Behaviors—Post-video (PCS-ES-M-SOC-SE-POST-V-4)

Table 15 presents participants' *post-video* responses to questions (Q.67-68), about their behaviors and confidence in relation to getting an annual physical exam. Twenty-two (53.7%) expected to see a medical provider and get a physical examination at least once a year. Twenty-two men (53.7%) said they had been doing this behavior for more than six months; another eight (19.5%) said they were preparing to do this, and five (12.2%) said they were thinking about doing so (M=3.95, SD=1.30). When asked about their confidence in performing this behavior (Q.68), the majority (n=23; 56.1%) were 100% confident that they could do so; another 11 (26.8%) were 80% confident that they could, and six individuals (14.6%) said they were 60% confident in this (M=87%, SD=16.6).

Table 15. Behavior of Getting a Physical (N=41)	*N*	%
(Q.67) ***When it comes to getting a physical exam at least once a year, check the following that most applies to you:*** ***(M=3.95, SD=1.30)***		
1. Not thinking about doing it	2	4.9
2. Thinking about doing it	5	12.2
3. Preparing to do it	8	19.5
4. Have been doing this for less than 6 months	4	9.8
5. Have been doing this for more than 6 months	22	53.7
(Q.68) ***When it comes to getting a physical exam at least once a year, HOW CONFIDENT ARE YOU in performing this behavior:*** ***(M=87%, SD=16.6)***		
0%	0	0
20%	0	0
40%	1	2.4
60%	6	14.6
80%	11	26.8
100% Extremely Confident	23	56.1

Table 16 shows participants' responses to Questions 69-72, about their behavior and confidence in discussing with a medical provider whether to receive a digital rectal examination or a PSA test to screen for PC. Asked whether/how often they do this, 12 (29.3%) replied that they are preparing to do this, and another 12 (29.3%) replied that they have been doing this for more than six months. Five (12.2%) participants said they were not thinking about it, and another five (12.2%) said they were thinking about it (M=3.32, SD=1.42). In response to Question 70—how confident they were in performing the behavior of discussing with their medical provider whether they should receive a digital rectal examination to screen for PC—14 (34.1%) selected 100% confident and another 14 selected the 80% confident category. The other responses were scattered throughout the other options (M=77%, SD=28.3). Then asked (Q.71) about their behavior in discussing with their medical provider whether they should receive a PSA test, 39.0% (n=16) said they were preparing to do this, and 22.0% (n=9) said they had been doing this for more than six months. Another five (12.2%) participants said they were thinking

about doing it (M=3.21, SD=1.27). The participants were then asked (Q.72) how confident they were in performing this behavior. Once again, most participants rated themselves highly in this regard: 17 (41.5%) chose the 100% confident category and 13 (31.7%) selected 80% (M=81%, SD=24.1).

Table 16. Behavior of Discussing with a Medical Provider (N=41)	*N*	%
(Q.69) ***When it comes to the behavior of discussing with your medical provider whether you should receive a digital rectal examination to screen for PC, check the following that most applies to you: (M=3.32, SD=1.42)***		
1. Not thinking about doing it	5	12.2
2. Thinking about doing it	5	12.2
3. Preparing to do it	12	29.3
4. Have been doing this for less than 6 months	3	7.3
5. Have been doing this for more than 6 months	12	29.3
6. N/A: I have PC and already know my status	2	4.9
7. N/A: I have had PC previously	2	4.9
(Q.70) ***When it comes to the behavior of discussing with your medical provider whether you should receive a digital rectal examination to screen for PC, <u>HOW CONFIDENT ARE YOU</u> in performing this behavior: (M=77%, SD=28.3)***		
0%	2	4.9
20%	2	4.9
40%	1	2.4
60%	3	7.3
80%	14	34.1
100% Extremely Confident	14	34.1
7. N/A: I have PC and already know my status	3	7.3
8. N/A: I have had PC previously	2	4.9
(Q.71) ***When it comes to the behavior of discussing with your medical provider whether you should receive a PSA test to screen for PC, check the following that most applies to you: (M=3.21, SD=1.27)***		
1. Not thinking about doing it	4	9.8
2. Thinking about doing it	5	12.2
3. Preparing to do it	16	39.0
4. Have been doing this for less than 6 months	3	7.3
5. Have been doing this for more than 6 months	9	22.0
6. N/A: I have PC and already know my status	2	4.9
7. N/A: I have had prostate cancer previously	2	4.9

Table 16 (continued)

(Q.72) ***When it comes to discussing with your medical provider whether you should receive a PSA test to screen for PC, <u>HOW CONFIDENT ARE YOU</u> in performing this behavior: (M=81%, SD=24.1)***		
0%	1	2.4
20%	1	2.4
40%	2	4.9
60%	4	9.8
80%	13	31.7
100% Extremely Confident	17	41.5
7. N/A: I have PC and already know my status	1	2.4
8. N/A: I have had PC previously	2	4.9

Table 17 shows participants' self-reported behavior and confidence in relation to spreading awareness among other African American men about the need for PC screening (Q.73-74). Asked whether/how often they were thinking about spreading such awareness, 41.5% (n=17) said they were preparing to do so (Q.73), 29.3% (n=12) responded that they were thinking about doing it, and 17.1% (n=7) said they had been doing so for more than six months, while two others (4.9%) said that they had been spreading awareness for less than six months. Only three (4.3%) said that they were not thinking about doing so (M=2.95, SD=1.16). Asked how confident they were in performing this behavior (Q.74), 16 (39.0%) rated their confidence level as 100%, and another 13 (31.7%) rated their confidence at 80%, while six (14.6%) participants considered their confidence level to be 60% (M=78%, SD=24.6).

Table 17. Spreading Awareness (N=41)	*N*	%
(Q.73) ***When it comes to spreading awareness among other AA men about the need for PC screening: (M=2.95, SD=1.16)***		
1. Not thinking about doing it	3	7.3%
2. Thinking about doing it	12	29.3%
3. Preparing to do it	17	41.5%
4. Have been doing this for less than 6 months	2	4.9%
5. Have been doing this for more than 6 months	7	17.1%

Table 17 (continued)	*N*	%
(Q.74) ***When it comes to spreading awareness among other AA men about the need for PC screening, <u>HOW CONFIDENT ARE YOU</u> in performing this behavior: (M=78%, SD=24.6)***		
0%	0	0%
20%	3	7.3%
40%	3	7.3%
60%	6	14.6%
80%	13	31.7%
100% Extremely Confident	16	39.0%

Part IX: Movements in Stages of Change to Perform the Four Target Behaviors

Table 18 shows the paired t-test results based on Part V and Part VIII of this research that explores stage of change in the four target behaviors. To measure movement across the stages of change, paired t-tests were carried out for four pairs of questions that compared the change, or difference, between the pre- and post-scores for the target behaviors. The mean values and standard deviations were then compared for each question, and the t values, mean difference, and p values (Sig. 2 tailed) of each pair were obtained. While sample size N equals 41, some pairs were made with fewer observations because pairwise deletion was used. The use of pairwise deletion means that some of the

Table 18. Paired t-test Results Based on Parts V and VIII (N=41)

Variable	***n***	***Pre-test Mean (SD)***	**Post-test Mean (SD)**	**Cohen's *d***	**t-statistic**	**p-value**
Pair 1	41	3.93(1.35)	3.95(1.30)	.015	.167	.868
Pair 2	37	3.32(1.53)	3.32(1.42)	.000	.000	1.00
Pair 3	37	2.81(1.41)	3.22(1.27)	.306	2.115	.041*
Pair 4	41	2.66(1.33)	2.95(1.16)	.234	2.221	.032*

*Sig. (2-tailed)<0.05. All values above 0.05 are considered non-significant and only those below 0.05 are considered statistically significant.

Note the smaller n (<41) for some pairs is a result of a missing pre- or post-score since pairwise deletion was used.

Each pair in table 18 is a change score, or a mean difference in an outcome that was measured both before (pre) and after (post) the intervention. Pair 1 refers to the change score of Q.67-Q.57 (getting a physical exam at least once a year), pair 2 refers to the difference between Q.69 and Q.59 (discussing with doctor about receiving a digital rectal exam), pair 3 refers to the difference between Q.71 and Q.61 (discussing with doctor about receiving a PSA test), and pair 4 refers to the difference between Q.73 and Q.63 (spreading awareness among other AA men about PC screening).

means and SDs reported in table 18 are different that the means and standard deviations reported in earlier sections because if any respondent was missing a measurement, either pre- or post-, then that individual (and their scores on both pre- and post-measures) were dropped from the analysis. The significance level was set at 0.05 for the two-tailed hypothesis test (results shown in Table 18), statistically significant improvements are denoted with an asterisk (*) on each relevant p value.

The test results reveal that participants showed significant improvement in their behavior for two of the four target behaviors. In particular, this study has found statistically significant improvements in the behavior of discussing receiving a PSA test with their doctor (t(37)=2.115, p-value=.041) and the behavior of spreading awareness of PC among other African American men (t(41)=2.221, p-value=.032). No significant results were found for the behavior of getting an annual physical exam (t(41)=.167, p-value=.868) or the behavior of receiving a digital rectal examination (t(37)=.000, p-value=1). Cohen's d is used to measure the magnitude of these effects. As per Cohen's (1988) guidelines, the estimated effect sizes for the behavior of getting a PSA year (d = .306) and spreading awareness of PC screening among African American men (d = .234) would be considered small effects. In sum, there is strong evidence that the e-health intervention created in this study significantly improved the stages of change for two of the four target behaviors.

Part X: Movements in Self-Efficacy to Perform the Four Target Behaviors

Table 19 shows the paired t-test results based on Part V and Part VIII of this research that explore changes in self-efficacy. To measure changes in self-efficacy, paired t-tests were carried out for four pairs of questions that compared the change, or difference, between the pre- and post-scores for confidence regarding the four target behaviors. The mean values and standard deviations were then compared for each

question, and the t values, mean difference, and p values (Sig. 2 tailed) of each pair were obtained. As in part IX, pairwise deletion means that some of the means and SDs reported in Table 19 are different that the means and standard deviations reported in earlier sections because if any respondent was missing a measurement, either pre- or post-, then that individual were dropped from the analysis.

A significant and positive change was detected in self-efficacy for carrying out three of the four target behaviors. Specifically, participants reported more confidence in discussing the potential of screening for PC via either a digital rectal exam (t(36)=3.011, p-value=.005) or taking a PSA exam (t(38)=2.431, p-value=.020) as well as their ability to spread awareness among AA men (t(41)=2.959, p-value=.005). No significant change in confidence was detected for the behavior of going and receiving an annual physical examination (t(41)=.819, p-value=.418). The three significant effects for changes in self-efficacy in getting a digital rectal exam (*d* = .354), getting a PSA exam (*d* =.302), and spreading awareness among African American men (*d* = .327) all represent small effects. In summary, this study found that the avatar video instrument significantly improved participants self-efficacy for three of the four target behaviors. Importantly, these three behaviors were the ones associated with PC screening.

Table 19. Paired t-test Results Based on Parts V and VIII (N=41)

Variable	***n***	***Pre-test Mean (SD)***	Post-test Mean (SD)	Cohen's d	t-statistic	p-value
Pair 1	41	84.88(19.89)	87.32(16.59)	.133	.819	.418
Pair 2	36	66.11(34.08)	77.22(28.35)	.354	3.011	.005*
Pair 3	38	73.16(28.01)	81.05(24.14)	.302	2.431	.020*
Pair 4	41	68.78(29.00)	77.56(24.57)	.327	2.959	.005*

*Sig. (2-tailed)<0.05. All values above 0.05 are considered non-significant and only those below 0.05 are considered statistically significant.

Note the smaller n (<41) for some pairs is a result of a missing pre- or post-score since pairwise deletion was used.

Each pair in table 18 is a change score, or a mean difference in an outcome that was measured both before (pre) and after (post) the intervention. Pair 1 refers to the difference between Q.68 and Q.58 (confidence in getting a physical exam at least once a year), pair 2 refers to the difference between Q.70 and Q.60 (confidence in discussing with doctor about receiving a digital rectal exam), pair 3 refers to the difference between Q.72 and Q.62 (confidence in discussing with doctor about receiving a PSA test), and pair 4 refers to the difference between Q.74 and Q.64 (confidence in spreading awareness among other AA men about PC screening).

Part XI: Relationship between Demographic Variables and Other Study Scales with the Target Behavior of Going to Get a PSA Test to Screen for PC (Pre-measure)

Part XI of this study considers the association between receiving a PSA exam (Q.61) to screen for PC and participant characteristics. Q.61 represents the pre-measure of this variable, so by considering the association of this variable before the intervention the findings are more generalizable to African American men in the population since the measurement of this variable would not be affected by the e-health intervention. Since Q.61 is measured on the ordinal scale level (as can be seen in part V of this dissertation), Spearman's rank correlation coefficient was used to assess the association between Q.61 and participant characteristics. Specifically, this section considers the relationship between Q.61 and participant characteristics, which include selected demographic characteristics, health status, and participant health literacy (ability and self-efficacy) measures.

Table 20 shows the Spearman correlation between participant demographic characteristics and Q.61.[2] Both age (ρ=.442) and educational level (ρ=.324) have positive and statistically significant relationships with Q.61. This shows that older study African American males were more likely to be in an action or maintenance stage concerning the behavior of receiving a PSA exam to screen for prostate cancer. Furthermore, participants with higher levels of education were more likely to get a PSA exam to screen for PC. Both significant effects make theoretical sense; as men become older PC becomes a larger threat and we would expect older men to be more proactive in preventative screening of PC. Achieving higher levels of education is also widely assumed to lead to more preventative health behaviors. Surprisingly, there was no significant relationship

[2]Other demographic variables were not considered for various reasons. For example, there was no variation in the race/ethnicity variable (Q.12) while the relationship status (Q.11) and employment (Q.19) variables were categorical (not measured on a numeric or ordinal scale) since they gave respondents the option to select multiple categories.

between income and Q.61, though the effect size (ρ=.260) was far from zero, suggesting that if the study sample had been larger this relationship would likely have been significant.

Table 20. Spearman's Correlation Coefficient between Being in Action or Maintenance Stage for Receiving a PSA Exam to Screen for PC (Q.61) and Participant Demographics

Variable	*n*	*Spearman's rho*	p-value
Q.10	40	.442	.004*
Q.17	40	.260	.105
Q.18	40	.324	.041*

(N=40, significance level=0.05, two-tailed hypothesis test)
*Sig. (2-tailed)<0.05. All values above 0.05 are considered non-significant and only those below 0.05 are considered statistically significant.
Each question represents a different variable in this study: Q.10 measures age, Q.17 measures participant income, and Q.18 measures the highest educational attainment for each participant.

There was no significant relationship between Q.61 and most health measures recorded in this study, as can be seen in Table 21. The lone exception was the positive relationship observed between Q.25 and Q.61 (ρ= .324)—as participants viewed their overall quality of healthcare as better, they were more likely to have had a PSA exam to screen for prostate cancer. Although not statistically significant, a positive relationship was found for overall self-rated quality of care received from primary care provider and the degree of perceived sensitivity and competence for treating African Americans by the healthcare providers, as compared to the care provided to whites. This study also found a negative relationship between BMI, weight-self rating and overall health status. These negative correlations are sensible: healthier participants were less likely to go in for a PC screening while participants who weighted themselves as more obese were also less likely to be screening for PC.

Table 21. Spearman's Correlation Coefficient between Being in Action or Maintenance Stage for Receiving a PSA Exam to Screen for PC (Q.61) and Participant Health Status

Variable	*n*	*Spearman's rho*	p-value
Q.20	40	-.085	.602
Q.21/22	40	-.167	.309
Q.23	40	-.060	.713
Q.25	40	.324	.044*
Q.26	40	.226	.166
Q.27	40	.054	.745

*Sig. (2-tailed)<0.05. All values above 0.05 are considered non-significant and only those below 0.05 are considered statistically significant.
Each question represents a different variable in this study: Q.20 measures overall health status, Q.21/22 asked about height and weight and was used to make a measure of BIM, Q.23 measures weight self-rating, Q.25 measures a self-reported quality of care received for the participants' health/medical condition, Q.26 measures the overall self-rated quality of care received from primary care provider, and Q.27 measures the degree of perceived sensitivity and competence for treating African Americans by the healthcare providers, as compared to the care provided to whites.

This study also considered the participant's ability to carry out a range of health-related behaviors. As seen in Table 22, all variables that measured health-literacy behaviors had a positive relationship with the behavior of going to get a PSA exam, as expected, even though only a few areas of health-literacy ability had a significant relationship with Q.61. In particular, Q.41 (ability to seek out health information), Q.43 (ability to seek out health services), and Q.47 (ability to understand what a health professional has told them) all had significant relationships. A few other variables (Q.49, Q.53, and Q.55) were close to significance but the small sample size resulted in insignificant findings.

Table 22. Spearman's Correlation Coefficient between Being in Action or Maintenance Stage for Receiving a PSA Exam to Screen for PC (Q.61) and Health-Literacy Measures

Variable	*n*	*Spearman's rho*	p-value
Q.41	40	.490	.001*
Q.43	40	.439	.005*
Q.45	40	.202	.212
Q.47	40	.382	.015*
Q.49	40	.271	.091
Q.51	40	.183	.259
Q.53	40	.302	.059
Q.55	40	.304	.056

*Sig. (2-tailed)<0.05. All values above 0.05 are considered non-significant and only those below 0.05 are considered statistically significant.
Each question represents a different variable in this study: Q.41 measures ability to seek out health information, Q.43 measures ability to seek out health services, Q.45 measures ability to communicate with a health professional, Q.47 measures ability to think about what a health professional has communicated to them, Q.49 measures ability to understand what a health professional has told them, Q.51 measures ability to memorized and repeat out loud what a health professional has told them, Q.53 measures ability to ask probing questions to a health professional, and Q.55 measures ability to make the best health decisions for oneself.

Finally, Table 23 shows the association between receiving a PSA exam and participants' confidence in carrying out a range of health-related behaviors. Similar to the findings of this study for health-literacy ability, all measures for confidence in health-literacy behaviors were positively related to the behavior of getting a PSA exam. Four of the eight measures of confidence in health-literacy behaviors were significantly related to Q.61: confidence in seeking out health information (Q.42), confidence in seeking out health professionals (Q.44), confidence to think about what a health professional told them (Q.48) and confidence to understand what a health professional told them (Q.50).

Table 23. Spearman's Correlation Coefficient between Being in Action or Maintenance Stage for Receiving a PSA Exam to Screen for PC (Q.61) and Self-efficacy for Health-Literacy Measures

Variable	*n*	*Spearman's rho*	p-value
Q.42	40	.560	.000*
Q.44	40	.409	.009*
Q.46	40	.277	.084
Q.48	40	.377	.016*
Q.50	40	.337	.033*
Q.52	40	.216	.180
Q.54	40	.302	.059
Q.56	40	.290	.069

*Sig. (2-tailed)<0.05.
Each question represents a different variable in this study: Q.42 measures confidence to seek out health information, Q.44 measures confidence to seek out health services, Q.46 measures confidence to communicate with a health professional, Q.48 measures confidence to think about what a health professional has communicated to them, Q.50 measures confidence to understand what a health professional has told them, Q.52 measures confidence to memorized and repeat out loud what a health professional has told them, Q.54 measures confidence to ask probing questions to a health professional, and Q.56 measures confidence to make the best health decisions for oneself.

Part XII: Predicting the Target Behavior of Going to Get a PSA Test to Screen for Prostate Cancer (Pre-measure)

Table 24 shows the result for four multiple regression models. The dependent variable was the behavior of discussing with medical provider screening for prostate cancer via PSA test (Q.61) and was measured on a 5-point ordinal scale: (1) I am not thinking of doing this behavior at all, (2) I am thinking about doing this behavior, (3) I am preparing to do this behavior, (4) I have been doing this behavior less than six months, and (5) I have been doing this behavior for more than six months. Q.61 was a pre-intervention measure and thus was not contaminated by the intervention/study. Four models were created by regressing Q.61 on a subset of variables: Model 1 included demographic variables, model 2 included health status variables, model 3 included a set of dichotomous health-history variables, and model 4 was the result from a backward

stepwise regression analysis. No models violated the assumptions of normally distributed and constant variance of the errors. In all cases, listwise deletion was used; Table 24 includes the number of cases that were include in each model, the R^2, and the F-test.[3]

Model 1 had an R^2 of .359 and a significant F-test and used demographic variables as the covariates. Age (p-value = .011) and years of education (p-value = .015) were significant while income (p-value = .903) and married (p-value = .148) were not. The direction of all relationships was as anticipated, age, education and being married were positively related with the Q.61. The estimate for income (β=.000) was basically 0, which might be explained by low variability in this measure since this study oversampled high income individuals. In model 4, the backward stepwise regression, none of the demographic variables were retained in the final model.

Model 2 explored the relationship between Q.61 and health status; it had a significant R^2 of .391. Model 2 had a few significant predictors, including overall health status (p-value = .015), private insurance (p-value = .027), overall quality of health care for participants' health/medical conditions (p-value = .002), and overall quality of health care from health care provider (p-value = .032). BMI (p-value = .521), weight self-rating (p-value = .891) and the sensitivity and competence of the health care provider for treating African Americans were not significant (p-value = .305). The direction of all relationships was as expected, except for the negative association between the DV and quality of overall health care for medical condition. The negative relationship of Q.26 is likely due to how the model is specified: even though its partial relationship appears

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[3] Not all of the variables shared in earlier parts of the findings section could used. For example, race could not be used in regressions because there was no variation in this measure (40 participants indicated that they were black/African American while a single respondent indicated that they mixed race). For employment status and relationship status, most of the categories were omitted due to small groups in most categories. Uneven response distributions prevented the use of other variables in later models, such as the death of a father (n=1) or brother (n=0) from prostate cancer in the third model.

negative in the model, in part XI this study found its raw Spearman correlation with the DV to be positive (ρ= .266).

Model 3 considered the relationship of a subset of health-history variables with the behavior of receiving a PSA exam; it had an R^2 of .618 and had a significant F-test. Two of the four regressors showed a positive and significant relationship with the DV: having a digital rectal exam (p-value = .002) and being screened by doctor for prostate cancer (p-value = .002). The other two variables, being told by doctor that they are at risk of prostate cancer (p-value = .467) and having a family member that died of PC (p-value = .937), did not have a significant association with Q.61. The higher R^2 in this model (as compared to models 1 and 2) suggests that the two significant variables, receiving a digital rectal exam and being screened for PC by a doctor, were the independent variables that had the strongest relationship with the DV in this study. This is supported by the backward stepwise regression analysis carried out by model 4, which converged on a solution where two of the four variables it kept were variables measuring health-history.

Backward stepwise regression works by starting with a full model of all variables and then iteratively deleting one variable at a time based on some model fit statistic. Model 4 started with four demographic variables, seven health-status variables, and four health-history variables. In the end, the model converged on a solution with only four independent variables: BMI (p-value = .018), having private insurance (p-value = .001), receiving a digital rectal exam (p-value < .001), and being screened for PC by a doctor (p-value < .001). All four independent variables were significant at the .05 level, and these results are theoretically sound. The high R^2 means the combination of the three covariates explains 76.9% of the variation in the behavior of getting a PSA exam to screen for PC.

Table 24: Regression Models between Receiving PSA Exam (Pre) and Selected Covariates

Variable	Model 1	Model 2	Model 3	Model 4
Age (Q.10)	.045*			
	(.017)			
Married (Q.11)	.674			
	(.455)			
Income (Q.17)[4]	.000			
	(.001)			
Highest Education	.372*			
(Q.18)	(.145)			
Overall Health (Q.20)		-.899*		
		(.347)		
BMI (Q.21/22)		-.038		-.077*
		(.058)		(.031)
Weight Self-Rating		-.068		
(Q.23)		(.495)		
Private Insurance (Q.24)		1.229*		1.133*
		(.530)		(.294)
Quality of Health Care		1.979*		
for Medical Condition		(.578)		
(Q.25)				
Quality of Medical Care		-1.208*		
Quality from Primary		(.538)		
Care (Q.26)				
Sensitivity of Primary		-.218		
Care Provider to African		(.209)		
Americans (Q.27)				
Risk of Prostate Cancer			.279	
(Q.29)			(.378)	
Had a Digital Rectal			1.335*	1.350*
Exam (Q.30)			(.399)	(.325)
Screened by Doctor for			1.221*	1.496*
PC (Q.32)			(.354)	(.268)
Family Member that			.050	
Died of PC (Q.35)			(.628)	
Constant	-4.018	4.741	-1.344	.018
	(2.243)	(2.914)	(.933)	(.936)
N	40	38	35	33
R^2	.359	.391	.618	.769
F-test	4.894*	2.752*	12.139*	23.336*

*Sig. (2-tailed)<0.05.

[4] This variable was scaled to the thousands of US dollars.

Standard errors in parenthesis.

Part XIII: Intention to Engage in Diffusion of the Innovation of Watching the Avatar Video (DIWV-2)

Table 25 displays participants' intention to recommend or not recommend the educational Avatar video to other men (Q.75). The overwhelming majority (39, 95.1%) of participants said that they will recommend it; only two (4.9%) said that they will not.

Table 25. Video Recommendation (N=41)	*N*	%
(Q.75) ***Will you recommend the avatar video to other men?*** **(M=1.05, SD=.22)**		
1. Yes	39	95.1
2. No	2	4.9

Table 26 presents the qualitative data produced by this PC research and shows the opinions and feedback (Q.76) of all 41 participants on the Avatar video. The opinions were mostly positive and many of the participants indicated that they intended to share the knowledge gained, or even the video itself, with other African American men they knew. Some of the most common reasons for sharing the e-health video included how accessible it was, the clear and direct manner of how the content was communicated, and how informative it really was. As one respondent replied, the e-health video was "informative, culturally competent and forces one to analyze thoughts and behaviors." On the negative side, there were a few respondents how thought the animation/acting could have been improved – but even so, the majority thought the e-health video production was good for what it aimed to achieved. A few respondents indicated that they were going to share the tool with others, with one saying they posted it to their Facebook wall, and also indicated that were part of a cancer support group. In summary, responses to the open-ended question (Q.76) suggests that the majority of participants that were involved in this study do intend to share the e-health video with other others.

Table 26. Intention to Engage in Diffusion of the Innovation of Watching the Avatar Video (DIWV-2)

(Q.76) Why would you recommend or not recommend the video cartoon to others? Please explain why or why not. What other comments do you have?
• It is very clear and to the point.
• It is direct with great facts about why we should get screened
• YES
• It made it all very easy to understand
• I do not feel alot of the information it being shared or black male going to doctors where they could get the information.
• It is a good educational tool.
• video explained African American men are most vulnerable. very straight forward regarding our fears of getting an examination.
• This video was tremendously informative, culturally competent and forces one to analyze thoughts and behaviors.
• Video is highly informative and information is crucial and prudent to all African American men as they have the highest tendency to be stricken with prostate cancer
• My age group is very young for this video. I also don't believe this video was more able to communicate to me in a mature manner then others out there.
• I would recommend the video because I feel its informative and relatable
• I would recommend because it is simple and straight to the point. The graphics are also easy to internalize as opposed to reading dense material about it.
• I think this is a good video as it speak to the younger men or younger men and this is a population that is most at risk
• It provides awareness that is accessible to all types of black men, regardless of educational history.
• Not many men i know have access or the ability to use the internet.
• EVEN THOUGH ITS A CARTOON, IT'S VERY INFORMATIVE
• This information is very helpful to community
• It is highly informative and very good, great job!!
• The animation was perfect. The voice talent could have been much better.
• The facts in the video are true and to the point

Table 26 (continued)

- Well the cartoon was kinda cute, but when it comes to educating our black brothers and sisters we need to go straight to the point, that's why it should have been done with regular black men, real men discussing, and talking about rectal checking, and how they really feel about that procedure, but still giving the life or death situation, I think they will choose life, because in the real life video, we will identify ourselves as one of the guys in the video.
- I love my brothers and want them to live long productive lives.
- The video contains very good information.
- I get the point you're making. Yet the sadness and finality should be eliminated. As a survivor of prostate cancer, 1999 to present, all the doctors, white and black have helped me from the start. I found at the time of my diagnosis, it was not talked about. A athlete I think Jose Torre or Ed Koch got it and all of a sudden it was on the map. Until than black men were told you should get checked around the age of 50-55. Then I thought maybe that was what was killing all our older black men (unknown cause) in past years. I say stick to the obtaining information on Prostate cancer. Focus on the pride of having knowledge of the cure and not fear and the demeaning of having someone put their finger in your rear. I think someone said years ago, "You can choose between the Doctors finger or the Mortuary hose." Early detection is the way to go without question.
- I'd recommend seeing it because it has very useful information, it's visually appealing and the dialogue is in everyday language.
- I feel 100% confident in discussing the topic on my circle of friends and acquaintances. It is of paramount importance the information about this important test.
- It shared good information that all Black males over the age of 40 should know.
- The animation was choppy. The speech was not in sync. The representation of black men was the stereotypical skinny or muscular guy. And the one with cancer just so happened to be an overweight/obese black man. And the voices and gesters do no sound or look like a typical black man. Add some real dark skin brothers. Why are all the men shades of brown?
- The video was informative, despite being poorly acted out.
- I would recommend the video cartoon to others because everything they said in the video it's true. This is a good example for African American men.
- Good information

Table 26 (continued)

- I would because of the information. I might not because of the quality of the actors' rendering of the information.
- I did not appreciate the part of the video that implies that African American men only care about "sex" when it comes to mitigating a prostate diagnosis.
- more information, the better.
- This video contains useful information about prostate cancer and the format used may be appealing to certain viewers. However, using the premise of an informal conversation as the only means to deliver this message undermines the information presented. The black doctor that appears for a few seconds at the end of the video could have been utilized to deliver some of the information presented by the men having the conversation.
- I thought it was well presented and researched. As PROSCAN survivor, I could relate having had the same dialogue with friends and family. Furthermore, even though in the end, I managed to retain the best physicians and highest level of care, this was not the case in the beginning when I was experiencing difficulties with benign hyperplasia...or enlarged prostate, chronic prostatitis with apparent symptoms including urgency and rectal pain. some doctors mocked me as being a hypochondriac because they deemed me too young to be contending with these issues. I did not experience rejection because of race. Perhaps it could it have been because I am light skinned and highly educated? Alternatively it could have been because I am assertive and command answers as well as respect. In the questioning, I would include: have or ""had"" prostate cancer. this is why I no longer get digital exams. My prostate gland was taken. I do go annually for the PSA test.
- Just posted it on my Facebook Page. Although I have been diagnosed I am an avid supporter of Cancer Treatment. I am a member of a Cancer Support Group. I walk, I give, I serve, I support.
- Sometimes its not enough to just tell someone to get there prostate exam. Every platform should be utilized. If a cartoon educates one person, its important.
- It provided me with new information and may be helpful to others.
- I would recommend the video to other men because it has valuable information in it. However the video does not sustain one's attention, thereby reducing the amount of info each viewer receives.
- the information is very good for all men, it may start them to take some action.

Anticipated Findings from Data Analysis

This study also made a range of hypotheses about the relationship between the behavior of getting a PSA exam to screen for prostate cancer (Q.61) and various characteristics of the study participants. In particular, it was anticipated that the significant predictors of being in an action or maintenance stage for making sure they receive a PSA test to screen for prostate cancer (target behavior #3)—as measured before watching the video, will be the following independent variables:

- Higher level of education
- Higher socioeconomic status
- Lower Body Mass Index (BMI)
- Higher health literacy skills and self-efficacy
- Higher pre-video viewing self-efficacy for (1) going to see a medical provider and getting a physical examination at least once a year, (2) making sure they receive a digital rectal examination to screen for prostate cancer, (3) making sure they receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening

To test for a significant relationship between these covariates and the DV, a series of simple linear regression models were estimated. Additionally, a backward stepwise regression procedure was used where all of these independent variables were included in the analysis. All models were check for the assumptions of normally distributed errors as well as homoscedasticity, and there were no major violations. Table 27 has the regression models performed to test the above hypotheses; significance of each independent variable is marked by an asterisk and the R^2 and F-statistics are included at the bottom of the table. Note that this analysis used income to proxy socioeconomic status and the variables

for health literacy skills and self-efficacy represent the average scores for two subscales, each of eight items, from the health literacy scale (SM-HL-V-S-SE-16).

As seen in Table 27, most of these hypotheses were borne out by the data. Specifically, this study lends support that there is a significant positive relationship between health literacy skills (p-value = .008), health literacy self-efficacy (p-value = .008), seeing a medical provider and getting a physical exam annually (Q.58, p-value =.030), discussing with medical provider about receiving a digital rectal exam to screen for prostate cancer (Q.60, p-value < .001), discussing with medical provider about receiving a PSA test to screen for prostate cancer (Q.62, p-value <.001) and spreading awareness among other African American men (Q.64, p-value = .001). Thus, models 4-9 support the anticipated hypotheses concerning health literacy skills and self-efficacy and the expected positive relationship between self-efficacy for the target behaviors (pre-measures) and the behavior of going to get a PSA exam (Q.61). Regarding the first three hypotheses listed above, this study did not find significant results though the anticipated direction of the relationship was as expected: there was a positive relationship between education level (p-value = .050) and the proxy for socioeconomic status, income (p-value = .610) while there was a negative relationship between BMI and Q.61 (p-value = .390). In terms of effect sizes, R^2 can be used since each of these models only contain a single independent variable. The bottom of Table 23 shows that Q.60 (self-efficacy of discussing getting a digital rectal exam with doctor) and Q.62 (self-efficacy of discussing getting annual PSA exams with doctor) had the strongest relationship with the DV, explaining 37.7% and 41.4% of the variance of Q.61 respectively.

In summary, the hypotheses made at the start of this study were borne out by the data: in all cases the directionality was as expected, and many of the hypothesized associations were significant.

Table 27. Regression Models between Receiving PSA Exam (Pre) and Selected Covariates

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)	Model (9)
Highest Education (Q.18)	.329								
	(.163)								
Income (Q.17)		.001							
		(.002)							
BMI (Q.21/22)			-.044						
			(.050)						
Health Literacy[1]				.813*					
				(.289)					
Health Literacy SE[2]					.039*				
					(.014)				
Seeing medical provider annually SE (Q.58)						.025*			
						(.011)			
Discussing getting annual digital rectal exam SE (Q.60)							.025*		
							(.006)		
Getting annual PSA exam SE (Q.62)								.034*	
								(.006)	
Spreading awareness AA men SE (Q.64)									.024*
									(.007)
Constant	-2.015	2.858*	4.218*	-1.022	-.111	.842	1.231*	.475	1.280*
	(2.465)	(.292)	(1.447)	(1.426)	(1.113)	(.958)	(.428)	(.510)	(.519)
N	40	40	39	40	40	40	39	40	40
R^2	.097	.007	.020	.173	.171	.119	.337	.414	.243
F-test	4.089	.265	.758	7.934*	7.847*	5.109*	18.827	26.842*	12.212*

[1] Health literacy is the average of eight items that assess health literacy: Q.41, Q.43, Q.45, Q.47, Q.49, Q.51, Q.53, Q.55.

[2] Health literacy self-efficacy is the average of eight items that assess health literacy: Q.42, Q.44, Q.46, Q.48, Q.50, Q.52, Q.54, Q.56.

Chapter V

SUMMARY, DISCUSSION, IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSION

This chapter provides a summary of the dissertation research, as well as a discussion of the results, along with implications. This chapter also provides recommendations for future research and ends with a discussion of the limitations of this research and a final conclusion.

Summary of Research Study

The problem that this study addressed is the need to raise awareness in African American men about the fact that prostate cancer (PCa) disproportionately affects them as a group, both in incidence and in severity; and their attendant need to be knowledgeable and proactive about the disease and available healthcare options. The racial disparity they face is the largest for any major cancer, and so significant that the United States Senate passed a resolution in 2012 declaring PCa an epidemic among African American men (Prostate Health Education Network, 2013).

E-based education is one approach to addressing the need of African American men for increased awareness and information about diagnostic and treatment possibilities. A number of studies using this innovative approach—specifically designing and using avatars (i.e., cartoonlike videos that are culturally tailored to the target audience—have been conducted by fellows of the Research Group on Disparities in

Health (RDGH) at Teachers College, Columbia University, through the sponsorship of Professor Barbara Wallace, Director of the RGDH. These studies have all followed the work of Misra and Wallace (2012) in seeking to create e-health that is tailored to be culturally appropriate for the category of consumers of focus.

The present study is aligned with those studies, which have found that culturally appropriate avatars can serve as a brief intervention (Aiyedun, 2014; Chung, 2013; Garcia, 2013; Renne, 2013), fostering significant movement across stages of change (e.g., precontemplation to contemplation stage) and producing increases in self-efficacy for the performing behaviors of focus in the video.

One way to address disparities in health care service delivery is to empower African American men so they have a sufficiently high level of self-efficacy to be able to perform three target behaviors: (1) going to see a medical provider and getting a physical examination at least once a year; (2) making sure they receive a digital rectal examination to screen for prostate cancer; (3) making sure they receive a PSA test to screen for prostate cancer; and, (4) spreading awareness among other African American men about the need for prostate cancer screening –so they, too, can seek out prostate cancer screening. Thus, there is a rationale for this study investigating men's stage of change (i.e., theory of Prochaska & DiClemente, 1983) and self-efficacy (i.e., theory of Bandura, 1977, 1997) for performing these three target behaviors—first, before watching an online e-health avatar (cartoon-like) video, and, second, after watching the video. The rationale for developing and evaluating the online e-health avatar video on prostate cancer follows from numerous previous studies conducted by fellows of the Research Group on Disparities in Health (RGDH) of Teachers College, Columbia University that have found that such a video can serve as a brief intervention (Aiyedun, 2014; Chung, 2013; Garcia, 2013; Renne, 2013). Such studies have typically found evidence that an online avatar video can foster significant movement across stages of change (e.g. precontemplation to contemplation stage), as well as increases in self-efficacy for performing behaviors of

focus in the video. These studies have all followed the work of Misra and Wallace (2012) in seeking to create e-health that is tailored to be culturally appropriate for the category of consumers of focus.

It also follows, logically, that there is value in determining dose of exposure to the video (i.e., watched none, some, most, or all of the video). Dose of exposure may be a factor related to how the participants evaluate and rate the videos. Further, of interest is the participants' intent to recommend the video to others, or engage in diffusion of the innovation (Rogers, 1962, 1995) of e-health on prostate cancer. Reasons for either recommending or not recommending the e-health avatar video, as well as other comments offered, allowed the study men to express themselves freely, while qualitative data analysis identified emergent themes.

At the same time, there is a rationale for investigating potential underlying causal mechanisms or varied factors potentially operating. More specifically, there is a rationale for investigating demographic and background characteristics, including age, socioeconomic status, level of education, Body Mass Index (BMI)—as well as health insurance and ratings of their health status and health care; and, ratings of their health care providers for their cultural sensitivity and cultural competence.

Research has shown that potential factors are numerous. For example, they may be socioeconomic, biological, receipt of lower quality health care, a lack of cultural competency among physicians, deficiencies in nutritional intake—which can contribute to prostate carcinogenesis, as well as obesity and a lack of a healthy lifestyle (Wu & Modlin, 2012).

There is also a rationale for investigating level of health literacy, while operationalizing this as per the definition provided by the CDC (2014). The CDC has defined health literacy, as follows: "The Patient Protection and Affordable Care Act of 2010, Title V, defines health literacy as the degree to which an individual has the capacity to obtain, communicate, process, and understand basic health information and

services to make appropriate health decisions" (para. 1). Also, Mullins et al. (2010) identified a lack of health literacy as a potential factor in prostate cancer health disparities.

Other studies have selected as the study outcome variable/dependent variable being in an action or maintenance stage for the target behavior of interest (e.g., Garcia, 2013). Thus, there is a rationale for this study selecting the study outcome variable/dependent variable of being in an action or maintenance stage for [# (3)] making sure they receive a PSA test to screen for prostate cancer—as measured before watching the video. This study outcome variable/dependent variable permits investigating whether selected demographic and other study scales are significantly related, and exploring independent variables that may significantly predict it.

Summary of the Statement of the Problem

The problem that this study addresses is the need to increase awareness among African American men regarding their potential risk of prostate cancer (Hoffman et al., 2011) and the health disparities (Mullins et al., 2010; Wu & Modlin, 2012) characterizing their group, as well as foster discussion with doctors about their family history of prostate cancer and whether they should pursue prostate cancer screening—meaning involvement in the "prostate specific antigen (PSA) test and digital rectal examination (DRE)" which "enable the detection of early-stage and organ-confined disease among otherwise asymptomatic men" (Fowke et al., 2005, p. 333).

There is also a need to increase awareness of treatment options to compensate for a lack of physician education on the topic (Mullins et al., 2010). Further, there is a need for innovative approaches to health education. For example, there is the need to evaluate the feasibility of positively impacting decisions to discuss prostate cancer screening with one's physician through the use of e-health tailored to be culturally appropriate; and, also

positively impact knowledge of prostate cancer treatment options (Misra & Wallace, 2012)—i.e., using avatar videos (cartoon-like). In addition, it is important to asses the extent to which those exposed to the avatar videos intend to recommend it to other African American men, as they may engage in the diffusion of the innovation (Rogers, 1962, 1995) of e-health on prostate cancer. African American men so informed via e-health may be able to share the video with any men in their social networks regarding prostate cancer.

Summary of the Purpose and Objectives

The purpose of this study is to develop and evaluate an innovative online e-health avatar video (cartoon-like) tailored to be culturally appropriate for African American men—as a potentially viable approach to fostering patient discussions with their physicians about prostate cancer screening. In addition, the main purpose of the study is to identify significant predictors of African American men recommending the e-health video to other men.

While the present study followed that tradition of research, its purpose was to address the need to inform African American me about their disproportionate risk for PCa and healthcare options. Accordingly, an innovative online e-health avatar, tailored to be culturally appropriate for them, was developed, implemented, and evaluated to see if it would foster discussion about prostate screening between the men who were exposed to it, and their physicians. How likely were the men to follow up their exposure to the avatar by discussing their family's history of prostate cancer with their physicians and deciding whether to pursue prostate cancer screening (i.e., the prostate specific antigen [PSA] test and digital rectal examination [DRE], which detect "early-stage and organ-confined disease among otherwise asymptomatic men" (Fowke et al., 2005, p. 333).

In addition to learning if the African American men who watched the avatar would proactively address their risk for prostate cancer in this way, it was important to assess

the extent to which they intended to recommend the avatar to other African American men—thereby participating in the diffusion of this innovation (Rogers, 1962, 1995) to utilize e-health education as a way to inform this group as a larger whole about their risks for PCa. To ascertain if this objective was met, the study aimed to identify significant predictors of African American men recommending the e-health video to other men—men, who, in turn, might share the video with other men in their social networks.

Summary of the Research Questions and Survey

In accordance with the data analysis plan, a sample (N=41) of African American men who responded to the social marketing campaign listed on social media and took the survey on surveymonkey (https://www.surveymonkey.com/r/AAProstateCancer) and who watched the e-health avatar video (cartoon-like). The questions they answered are available in Appendix D and are associated with each of the research questions covered in the quantitative part of this study.

Quantitative Portion of Study

1. What are their demographic and background characteristics (e.g., age, socioeconomic status, level of education)?

   PART I: BASIC DEMOGRAPHICS (BD-9)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

2. What is their health status (e.g., Body Mass Index) and how do they rate their healthcare?

   PART II: BRIEF HEALTH SURVEY (BHS-8)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

3. What is the prevalence of diagnoses of prostate cancer, history of screening for prostate cancer, as well as the prevalence of prostate cancer in their family and in their social network—including deaths from prostate cancer and the metastasis of cancer?

PART III: PROSTATE CANCER SCALE (PCS-10)
Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

4. What is their health literacy, as measured in terms of relevant skills and self-efficacy to perform them?

   PART IV: SCALE MEASURING HEALTH LITERACY VIA SKILLS AND SELF-EFFICACY (SM-HL-V-S-SE-16)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

5. What is their stage of change and self-efficacy for (1) going to see a medical provider and getting a physical examination at least once a year, (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, and (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer?

   PART V: PROSTATE CANCER SCREENING EMPOWERMENT SCALE MEASURING STAGE OF CHANGE AND SELF-EFFICACY FOR FOUR BEHAVIORS—PRE-VIDEO (PCS-ES-M-SOC-SE-PRE-V-4)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

6. After watching an avatar (cartoon-like) video, what do they report as their dose of exposure to the video (i.e., watched none, some, most, or all of the video)?

   PART VI: DOSE OF EXPOSURE TO VIDEO (DOE-TV-1)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

7. How do they evaluate or rate the video in terms of the information shared?

   PART VII: RATE THE VIDEO (RTV-1)
   Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

8. After watching the video, what is their stage of change and self-efficacy for (1) going to see a medical provider and getting a physical examination at least once a year, (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening?

   PART VIII: PROSTATE CANCER SCREENING EMPOWERMENT SCALE MEASURING STAGE OF CHANGE AND SELF-EFFICACY FOR FOUR BEHAVIORS—POST-VIDEO (PCS-ES-M-SOC-SE-POST-V-4)

Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages

9. Did they move across stages of change from precontemplation or contemplation to preparation for any of the four target behaviors (i.e., (1) going to see a medical provider and getting a physical examination at least once a year, (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening?

   PART IX: MOVEMENTS IN STAGES OF CHANGE TO PERFORM THE FOUR TARGET BEHAVIORS
   Data Analysis Plan: Inferential statistics, specifically paired t-tests, comparing their pre-video viewing (PART V) to post-video viewing scores (PART VIII)

10. Did they experience an increase in self-efficacy or confidence to perform the four target behaviors from (i.e., (1) going to see a medical provider and getting a physical examination at least once a year, (2) discussing with their medical provider whether they should receive a digital rectal examination to screen for prostate cancer, (3) discussing with their medical provider whether they should receive a PSA test to screen for prostate cancer, and (4) spreading awareness among other African American men about the need for prostate cancer screening) from before to after watching the videos?

    PART X: MOVEMENT IN SELF-EFFICACY TO PERFORM THE FOUR TARGET EHAVIORS
    Data Analysis Plan: Inferential statistics, specifically paired t-tests, comparing their pre-video viewing (PART V) to post-video viewing scores (PART VIII)

11. Is there a significant relationship between selected demographics and other study scales with the study outcome variable/dependent variable of being in an action or maintenance stage for [# (3)] making sure they receive a PSA test to screen for prostate cancer—as measured before watching the video?

    PART X1: RELATIONSHIP BETWEEN DEOMGRAPHIC VARIABLES AND OTHER STUDY SCALES WITH THE TARGET BEHAVIOR OF GOING TO GET A PSA TEST TO SCREEN FOR PROSTATE CANCER (PRE-MEASURE)
    Data Analysis Plan: Inferential statistics, specifically Spearman correlations

12. What are the significant predictors of being in an action or maintenance stage for [# (3)] making sure they receive a PSA test to screen for prostate cancer—as measured before watching the video?

PART XI1: PREDICTING THE TARGET BEHAVIOR OF GOING TO GET A PSA TEST TO SCREEN FOR PROSTATE CANCER (PRE-MEASURE)
Data Analysis Plan: Multiple regression and backward stepwise regression analyses.

Mixed Methods Portion of Study

13. To what extent do they intend to diffuse the innovation of providing health education on prostate cancer via e-health in the form of an avatar video by either recommending or not recommending the video? And, what are their reasons for recommending or not recommending the avatar video, including any other comments they might have?

PART XIII: INTENTION TO ENGAGE IN DIFFUSION OF THE INNOVATION OF WATCHING THE AVATAR VIDEO (DIWV-2)
Data Analysis Plan: Descriptive statistics, including means, standard deviations, frequencies, and percentages; and the identification of emergent themes for the qualitative data.

Summary of the Literature Review

This chapter presents a review of literature relevant to this study. More specifically this chapter covers literature on the following topics: (1) lack of awareness of treatment options (Mullins et al., 2010); (2) lack of patient education by physicians (Mullins et al., 2010); (3) a need of increased awareness of prostate cancer (Mullins et al., 2010); (4) the world's highest incidence of PC (Hoffman et al., 2001); (5) been found to possess a lack of awareness of treatment options and suffer from a lack of education by physicians, resulting in lack of access to health care, as well as lower likelihood of seeking aggressive treatment options for localized PC (Mullins et al., 2010); (6) investigating men's stage of change (i.e., theory of Prochaska & DiClemente, 1983); (7) self-efficacy (i.e., theory of Bandura, 1977, 1997) for performing these three target behaviors—first, before watching an online e-health avatar (cartoon-like) video, and, second, after watching the video.

The rationale for developing and evaluating the online e-health avatar video on prostate cancer follows from numerous previous studies conducted by fellows of the Research Group on Disparities in Health (RGDH) of Teachers College, Columbia University that have found that such a video can serve as a brief intervention (Aiyedun, 2014; Chung, 2013; Garcia, 2013; Renne, 2013). Such studies have typically found evidence that an online avatar video can foster significant movement across stages of change (e.g., precontemplation to contemplation stage), as well as increases in self-efficacy for performing behaviors of focus in the video. These studies have all followed the work of Misra and Wallace (2012) in seeking to create e-health that is tailored to be culturally appropriate for the category of consumers of focus.

Regarding prostate cancer, Mullins et al. (2010) identified a lack "of awareness of treatment options and lack of patient education by physicians" (p. 566). Thus, there is a rationale for increasing awareness around prostate cancer.

Also, there is a rationale for investigating the prevalence of diagnoses of prostate cancer, history of screening for prostate cancer, as well as the prevalence of prostate cancer in their family and in their social network—including deaths from prostate cancer and the metastasis of cancer. Indeed, the rationale for this investigation is multifaceted, involving how African American/Black men have the following, with regard to prostate cancer (PC):

- the world's highest incidence of PC (Hoffman et al., 2001)
- been reported to experience a PC incidence two-thirds higher than Whites (Wu & Modlin, 2012)
- been found to possess a lack of awareness of treatment options and suffer from a lack of education by physicians, resulting in lack of access to health care, as well as lower likelihood of seeking aggressive treatment options for localized PC (Mullins et al., 2010)
- higher incidence of PC, and a higher mortality from PC, and present with a more aggressive PC—relative to European American men (Mullins et al., 2010)
- a lower likelihood of receiving more expensive or innovative treatment (Mullins et al., 2010)

- the lowest odds of receiving definitive therapy for prostate cancer—including the risk of developing higher grade prostate cancers and greater cancer specific mortality (Underwood et al., 2004)
- a pattern of being less likely to undergo radical prostatectomy compared to their White counterparts (Mullins et al., 2010)
- a risk of increased metastasis as a result of inaccurate staging, or a tendency for the PC not to be staged, or suffer from physicians failing to provide education on the importance of staging PC (Mullins et al., 2010)
- a pattern of presenting with more advanced prostate cancer disease with a poorer prognosis (Mullins et al., 2010)
- a shorter disease-free survival period relative to other racial groups (Mullins et al., 2010)
- suffer racial/ethnic disparities in prostate cancer mortality (Underwood et al., 2004)—specifically, a mortality rate twice as high as that of White men (Wu & Modlin, 2012)

Also noteworthy is how equivalent survival outcomes have been realized when Black and Whites had treatment assigned "in a uniform manner without regard to race (Wu & Modlin, 2012, p. 315). This further underscores the likely role of disparities in health care service delivery.

Finally, there is a rationale for the study's theoretical framework, given prior similar research studies (e.g., Aiyedun, 2014; Garcia, 2013; Chung, 2013; Renne, 2013). This framework includes the following: the stages of change from the transtheoretical model brought forth by Prochaska and DiClemente (1983); the self-efficacy theory advanced by Bandura (1977, 1997); and, the diffusion of innovation theory as per the work of Rogers (1962, 1995).

Summary of the Research Sample and Procedures

The study design was cross-sectional, and an online survey was developed using Survey Monkey technology. The survey was then entered into the public domain on the Internet through Survey Monkey at www.surveymonkey.com. A link to the study survey was established, and disseminated on all selected social media sites to launch the social marketing campaign for the study. The survey was titled, "African American Men's

Prostate Cancer Awareness Study." On December 17, 2014, the study received approval from the Teachers College, Columbia University Institutional Review Board (IRB). It was given the IRB Protocol #15-125 (see Appendix for IRB Approval Letter). The social marketing campaign was launched on January 28, 2015 on social media sites. Data collection began in late March 2015. At the close of the survey, the computer randomly chose three email addresses (which were unknown to the researcher) to award incentive prizes of online Amazon gift cards. In addition, the data were downloaded into SPSS 22.0 from Survey Monkey. The data were assessed for a series of research questions.

Summary of Research Instrumentation

The following measures were used for the research instrumentation:

- PART I: BASIC DEMOGRAPHICS (BD-9)
- PART II: BRIEF HEALTH SURVEY (BHS-8)
- PART III: PROSTATE CANCER SCALE (PCS-10)
- PART IV: SCALE MEASURING HEALTH LITERACY VIA SKILLS AND SELF-EFFICACY (SM-HL-V-S-SE-16)
- PART V: PROSTATE CANCER SCREENING EMPOWERMENT SCALE MEASURING STAGE OF CHANGE AND SELF-EFFICACY FOR FOUR BEHAVIORS—PRE-VIDEO (PCS-ES-M-SOC-SE-PRE-V-4)
- PART VI: DOSE OF EXPOSURE TO VIDEO (DOE-TV-1)
- PART VII: RATE THE VIDEO (RTV-1)
- PART VIII: PROSTATE CANCER SCREENING EMPOWERMENT SCALE MEASURING STAGE OF CHANGE AND SELF-EFFICACY FOR THREE BEHAVIORS—POST-VIDEO (PCS-ES-M-SOC-SE-POST-V-4)
- PART XIII: INTENTION TO ENGAGE IN DIFFUSION OF THE INNOVATION OF WATCHING THE AVATAR VIDEO (DIWV-2)

Summary and Discussion of Results of Research Questions

This section provides a summary and discussion of the findings of each research question. For each question, a summary of key research findings is presented first. This is followed by a discussion that places those findings in context.

Summary and Discussion for Research Question #1: Basic Demographics (BD-9)

Summary #1. Black/African American men, who are the research focus of this study, comprised 40 (97.6%) of its 41 African American participants. The remaining individual identified himself as mixed race. The average age of the study participants was 44 years old, with ages ranging between 20 and 64 years of age. In terms of the participants' relationship status, 31.7% (n=13) were married, 22.0% (n=9) had never married, 12.2% (n=5) were divorced, 9.8% (n=4) were in a committed relationship, 4.9% (n=2) of participants lived with a significant other, and 2.4% were dating. More than eighty percent (80.5%, n=33) of the participants were born in the U.S.

In terms of education and income, this study oversampled from a high socioeconomic stratum. Regarding their education, 36.6% (n=15) of the 41 participants had a Bachelor's degree, followed by 24.4% (n=10) with a Master's degree, 14.6% (n=6) with a Doctoral degree, and the remaining five (12.5%) had earned a GED or Associate degree. The mean household income was reported as $118,000, with two (4.9%) participants falling in the $200,000-$299,000 category and participant reporting that his income was over $800,000. There were a total of 13 participants who reported an income below $50,000, which is roughly equal to the median income in the U.S. As to their employment status, over half (58.5%, n=24) of the participants were employed full-time, followed by 14.6% (n=6) who were unemployed, and 9.8% (n=4) who were full-time graduate students. None of the study participants were receiving welfare.

Discussion #1. Forty-one study participants took the entire online survey, and 35 watched the entire avatar video that was presented as the instrument of the study. The

survey link was advertised on Facebook and Twitter and at Teachers College, but obtaining the originally intended number of 200 participants was a challenge, and it is one with deep historic roots. As Corbie-Smith et al. (1999) discussed, barriers exist to the participation of African Americans in research: "Mistrust of doctors, scientists, and the government was reported consistently" (p. 537) by participants in their focus groups. This mistrust centers on the motives and ethical conduct of the researchers, as well as a lack of clear understanding about what "informed consent" means. "Many participants," Corbie-Smith et al. wrote, "described concerns about the ethical conduct of clinicians and investigators when poor or monitory patients are involved and cited examples of exploitation as supporting evidence for their mistrust of the medical establishment" (p. 537). As one participant stated, "They always use our race as guinea pigs" (p. 538).

Throughout the focus group interviews, Corbie-Smith et al. (1999) stated that participants referred to the Tuskegee Syphilis Study (p.541). Many of them believed that the African American subjects of this widely known study had been injected with syphilis by the researchers as an experiment. And, while the Tuskegee study was the lynchpin of such suspicions, Corbie-Smith et al. further noted that "several participants believed other related 'experiments' and 'conspiracies' validated their concerns about the Tuskegee Syphilis Study," (p. 541). Despite certain limitations of their study, which the authors describe, they conclude that it

> gives voice to African-American mistrust of the medical community in general and medical research in particular. The absence of trust has emerged as a stumbling block in efforts to include African Americans in clinical research. Although the Tuskegee Syphilis Study has come to symbolize exploitation of monitories, participants also believed HIV infection, Agent Orange exposure, and Central Intelligence Agency distribution of crack cocaine in black communities were contemporary evidence that the legacy of abuse continues in this population. (p. 546)

This longstanding and profound mistrust of medical research and researchers on the part of African Americans—the belief that medical researchers do not have their best

interests at heart (which has origins in experimentation that took place during slavery)—makes it more difficult to find African American individuals willing to participate in medical studies such as this one. In short, deep and ongoing suspicion within African American communities about the true purposes of medical research and initiatives impact the ability of researchers to find individuals willing to participate in studies. Unfortunately, the current study proved no exception to this difficulty.

Summary and Discussion for Research Question #2: Brief Health Survey (BHS-8)

Summary #2. Most respondents rather their overall health as either good (39%), very good (36.6%), or excellent (19.5%). About one-quarter of study participants had a BMI in the healthy range (26.8) which is defined by the CDC (2017) as the range of 18-25, while 15 participants (36.6%) and 11 participants (26.8%) fell into the overweight and obese ranges of BMI. Interestingly, 24 (58.5%) of the participants rated their weight to be in the normal range, while only 15 (36.6%) and 2 (4.9%) rated their weight rating as overweight or obese, respectively.

The majority of respondents had private insurance plan (73.2%), while 12.2% had Medicaid and only a single respondent had Medicare. When asked to rate their overall quality of health care, most responded positively: 24.4%, 48.8%, and 17.1% rated their overall quality of medical care as good, very good, and excellent respectively. Question eight on the Brief Health Survey asked how sensitive and competent their health care providers were for treating them as African American men, as compared to how their health care providers would treat White patients. Only one respondent indicated a negative response here, selecting poor, while 22% indicated good, 36.6% indicated very good, and 19.5% indicated excellent.

Discussion #2. The majority of participants in this study self-reported their health status as good to excellent, and most of them stated that they had a good relationship with their primary care physician. They also demonstrated a clear understanding of their

medical conditions and the treatment options available to them, which indicate an effective level of communication with their health providers. However, it must be noted that many of these participants were more highly educated than the individuals originally targeted for the study; and may have been more familiar, comfortable, and conversant with medical practitioners than less formally educated participants would have been, given the historic suspicion of African Americans toward medical researchers and practitioners.

The need for trust exists not only for medical researchers conducting studies, but in the practice of medicine, as well. According to the Institute of Medicine (2003), in *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, a lack of cultural sensitivity on the part of health providers contributes to a lack of patient engagement in effective communication regarding diagnostic results and treatment options. Moreover, as Eiser et al. wrote in their 2007 article, "The historical and cultural legacy of discrimination against African Americans influences their socioeconomic status and affects their health care interactions and clinical outcomes" (p. 177). On a national level, the U.S. Institute of Medicine's (2003) Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care, stated that "cross-cultural training should have a significant role in improving quality of care for minorities and eliminating racial and ethnic disparities" (p. 176).

A number of researchers have addressed this need and what such training should involve. For example, Eiser et al. (2007) wrote that:

> Educational methods should include both information about relevant social group history as well as some experiential component to emotively communicate particular cultural needs. The authors describe particular techniques that help bridge the cross-cultural clinical communication gaps that are created by patients' mistrust, lack of cultural understanding, differing paradigms for illness, and health illiteracy. (p. 176)

However, Eiser et al. also note that, despite "much [recent] interest in preparing physicians to care for patients from a variety of cultural and ethnic backgrounds … recent studies suggest that this area of medical education is the still most lacking" (p.176).

The need for cross-cultural training and sensitivity, which directly impacts the delivery and acceptance of healthcare options among African American patients, must be of ongoing concern because, as Eiser et al. (2007) also wrote, "The majority of African Americans will see non-African American physicians. The ability to cross cultural and ethnic divides is [therefore] an essential component of the 21st-century physicians' "toolkit" (p.179).

While cultural sensitivity is of general benefit to the practice of medicine, it is particularly indicated when medical practitioners and researchers interact with African Americans, given the historic and ongoing suspicions toward the medical community that were noted in Discussion 1. As Corbie at al. (1999) wrote:

> The issue of trust was a recurrent theme throughout the entire discussion of participation in research. Although participants expressed concerns about the ethical conduct of researchers in general, they also noted that a trusting relationship was important for them to feel comfortable as participants in clinical studies. (p. 545)

Moreover, Eiser et al. (2007) noted that "African American patients rated their encounters with physicians more rewarding and participatory when the physician was also African American" (p.179). Hopefully, advances in this area will continue to be made and will contribute to better outcomes in relation to PCa for African American men, and improve their willingness to participate in medical research studies and trials.

Summary and Discussion for Research Question #3: Prostate Cancer Scale (PCS-10)

Summary #3. The Prostate Cancer Scale asked respondents 10 questions about various behaviors regarding prostate cancer. The majority of study participants had never been told/diagnosed with prostate cancer (90.2%) or told that they were at risk (78%). 27

(65.9%) of the study sample had received a digital rectal exam, while 34.1% had not. Less than half (34.1%) had received a PSA exam to screen for prostate cancer.

In terms of knowing other people or family members that were diagnosed with prostate cancer, only nine subjects (22%) had someone in their family diagnosed with PC while 61% of the study participants had known someone who had been diagnosed with PC. Regarding those who had a family member diagnosed with PC, three of them reported their fathers had been diagnosed with prostate cancer while two, one, and one indicated that a grandfather, uncle, and bother respectively had been diagnosed with PC. When asked more generally if they knew anyone who had died from PC, 11 (26.8%) replied that they had. Of these eleven, ten of them only knew of a single person how had died from PC while one person two knew people who had died.

Discussion #3. While most of the participants in this study reported good health, access to healthcare, and only a minor amount of family history with PC, the U.S. Senate passed a resolution in 2012 that recognized PCa to be at epidemic proportions among African American men (Prostate Health Education Network, 2013). As noted earlier in this report, why this is the case among African American men specifically, continues to be a topic of discussion and research.

For example, Mahal et al. (2014) noted that:

> Racial treatment disparity remains a highly problematic issue that has been persistent with time and alarmingly is worse among men with high-risk disease who need treatment the most. The underlying reasons for these disparities must be carefully studied so that interventions can be designed to address the problem in the immediate future. Differences in insurance status, mistrust in the health-care system, patient preference, comorbidities, and socioeconomic status are the frequently hypothesized reasons for health-care disparities. (p. 389)

Mahal et al. also suggest some paths to changing such disparities in healthcare and PCa outcomes among African American men:

> To reduce disparate outcomes in aggressive cancers, it is clear that there will need to be equal access to cancer screening and interventions at the

> community level to educate populations about the risks of aggressive cancers, clinical trials that include adequate numbers of minority participants, and prospective research of interventions that can help determine the most efficacious approach to alleviate cancer disparities. These interventions will take time before targets are achieved. Meanwhile, one method of achieving more immediate reductions in disparities in cancer outcomes may be done by setting race-neutral treatment of aggressive disease as a quality metric that an institution must achieve to reach a certain quality status. (p. 391)

Other researchers, too, such as Gurudatta Naik and Tomi Akinyemiju (2017), have focused on the persistence of "racial disparities in cancer outcomes due to differential access to healthcare," and have noted that "the elimination of barriers to access excellent healthcare decreases this disparity" (p. 73). According to Naik and Akinyemiju, "a higher proportion of African American patients presented with metastatic disease, [which] suggests that access to timely, high quality treatment is a major factor in racial disparities in prostate cancer mortality" (p. 78). In addition, Mahal et al. (2014) note that:

> Provider-level factors may also contribute to the observed race-risk interaction and disparity. For example, if providers overestimate the comorbidity burden of AA patients, this may lead them to recommend definitive treatment less frequently. Alternatively, providers may not be sufficiently communicating to AA men with high-risk disease that their disease is significantly more lethal and needs to be treated more urgently than if they had intermediate-risk disease. (p. 390)

The findings of these and other medical researchers would seem to support this study's showing of a correlation between the good overall health status of these men and their relatively high level of access to healthcare, possession of health insurance, and their participation and relatively good communication with healthcare providers.

Summary and Discussion for Research Question #4: Scale Measuring Health Literacy Via Skills and Self-Efficacy (SM-HL-V-S-SE-16)

Summary #4. Two aspects of health literacy were considered in research question 4: participant skills and self-efficacy related to a range of behaviors. Most respondents rated themselves as competent for seeking out health information: 26.8% (n=11) rated themselves their ability as excellent in this regard, while 41.5% (n=17) and

19.5% (n=8) rated their ability as very good and good respectively. Accordingly, over 75% of study participants rated their confidence in seeking out health information as either 80% or 100% confident. In terms of seeing out actual health services, we again see a positive trend: more than 70% rated their ability as excellent or very good while more than 75% rated their confidence level at either 80% or 100%.

For communicating and asking questions about their health, 7 respondents rated their ability in this area as good, while 19 and 11 rated their ability as very good and excellent in this area. Once again, over 75% of respondents indicated that they were about 80% or 100% confident in communicating and asking questions about their health. Regarding the behavior of understanding what a health care provider tells them, most self-ratings are again high in this area: 22%, 43.9%, and 31.7% rated their ability as good, very good, or excellent respectively. Over 80% of the respondents indicated a 80%+ confidence level in understanding what a health care provider tells them. All respondents indicated their skill level in being able to ask probing questions to a health care provider to understand what has been communicated to them was either good, very good, or excellent. In terms of their confidence of asking probing questions, 11 placed their confidence level at 60%, while 19 and 11 rated themselves as 80% and 100% confident respectively for this behavior.

Discussion #4. With regard to how well participants believed they really understood what they were told by a health professional, Friedman et al. (2009) have noted the following about what they consider to be “adequate health literacy”:

> Numerous factors are associated with limited PrCA cancer screening behaviors among AA men including limited information, knowledge, and understanding about screening procedures; confusion between PrCA screening and diagnostic tests; fear of cancer itself; concern with sexual functioning if diagnosed with PrCA; lack of access to health care services; mistrust of the health care system; poor communication with health care providers; lack of health insurance; and inconvenient clinic hours. (p. 450)

In terms of understanding what a medical professional tells them, Friedman et al. (2009) discussed a number issues in this regard connected to health literacy:

> The majority of research on health literacy has focused on basic functional health literacy which is, according to the US Department of Health and Human Services and the American Medical Association, the ability to understand health care information.… Adequate health literacy does not only require skills needed to read and understand health-related information. It also involves being able to search proactively, access, and use the information in a manner that will positively influence health behaviors and health outcomes. While the concept of interactive literacy may actually be referring to skills related to information seeking and critical literacy may be individual empowerment and critical analysis of information as opposed to "literacy" per se. (p. 458)

By this definition, it can be said of participants who watched the Avatar video in the current study and reported their intention to change lifestyle behaviors based on the information in the video and share with other men what they had learned, that the video succeeded in promoting their "critical literacy," not just the skills associated with what Friedman et al. refer to as "functional literacy."

Friedman et al. (2009) further noted that even basic, functional health literacy is a serious issue in the U.S. for a huge portion of the population:

> In the US, over 75 million adults have basic or below basic literacy abilities and are unable to understand health materials such as prescription labels or hospital consent forms.… Furthermore, 67% of AAs have basic or below basic literacy skills compared to 32% of EAs, and men have slightly lower literacy skills than women…. (p.450)

Researchers such as Ross at al. (2007) continue to study the barriers that contribute to the difficulty of getting African American men through the door of physician's offices, and then to undertake appropriate PCa screening. As they put it, they hoped to offer "some insight to identify factors in addition to or outside of socioeconomic status-related factors that may be important in physician-patient discussions such as reported health status," and added that "cultural, contextual, social-psychological, and/or personality

variables may help to explain the types of persons who are most likely to participate in physician-patient discussions or at least offer additional insight" (p. 160).

More specifically, Ross et al. (2007) described the purpose and scope of their study as an examination of "the sociodemographic and other correlates of physician-patient discussions regarding the advantages and disadvantages of the prostate-specific antigen (PSA) test among African American men aged 40 or older"—and to this end, they "examined all African American men aged 40 and older who had undergone a PSA test in the NHIS 2000," adding that "African Americans composed about 10% of the sample in the NHIS 2000" (p. 157). Their conclusion was clear: "African American men who were not having discussions with their physicians tended to be in fair or poor health, were not getting suggestions from their physicians to take the screening test, had not had a screening PSA text in the past 3 years, and had had health insurance coverage" (p. 162).

Reynolds (2008) also discussed barriers to PCA screening among African American men, and stressed the need for awareness about the importance of such screening, among both patients and medical practitioners: "American men," she wrote, "have less knowledge about the risk for developing prostate cancer and about prostate cancer in general." She continued: "Not knowing that screening was needed was cited as the Number 1 barrier of being screened for prostate cancer, in a descriptive correlation study, conducted by Shelton et al. (2005)" (p. 174). Reynolds further noted that some medical practitioners are unaware of the increased risk that African American men have for PCa, and stressed the importance of that knowledge:

> There may also be inadequate knowledge on the part of the physician as well as the patient. In a 2005 survey conducted by Miles, only three quarters of physicians in high-rate cancer states identified African American men as a high-risk group. Where does that leave African American men, if 25% of their health care providers are unaware of the cancer risks facing this group? (p. 174)

Such lack of information begs the problem that the current study was intended to address: how to get the needed information to African American men, who, as a group,

are at increased risk for PCa. In this regard, Reynolds (2008) cited a "2003 study conducted by Volk, Spann, Cass, and Hawley," which "found that videotape as an education decision aid for promoting informed decision making about prostate cancer resulted in a higher rate of screening for African American men" (p. 175).

In sum, barriers to PSA screening among African American men have been found not only to include their historic mistrust of the medical establishment, and lack of cross-cultural training on the part of medical practitioners—they may also include a lack of awareness on the part of physicians about the increased risk of AA men for PCa and the failure to communicate this increased risk to their African American male patients and discuss screening options.

These studies reaffirm and reinforce the crucial role of the patient-doctor relationship in preventing and screening for PCa. As Ross et al. (2007) wrote:

> Patient-provider communication is intimately linked with inadequate knowledge. If physicians and other health care providers are not getting the message out about the increased risk of African American men and prostate cancer, how is this group supposed to make an educated decision to get screened or not? (p. 174)

Summary and Discussion for Research Question #5: Prostate Cancer Screening Empowerment Scale Measuring Stage of Change and Self-Efficacy for Four Behaviors—Pre-video (PCS-ES-M-SOC-SE-PRE-V-4)

Summary #5. The fifth research question concerned stages of change and self-efficacy of four target behaviors (getting an annual physical exam, discussing with medical professional about getting digital rectal exam to screen for PC, considering getting a PSA exam to screen for PC, and spreading awareness of PC among African American men) *before* watching the video. As it pertains to the first target behavior of getting a physical exam at least once a year, the majority (56.1%) of the study participants indicated that they have been performing that behavior for more than six months—which is considered the action and maintenance stage. 22% (n=9) of the respondents were in the contemplation stage of "thinking about doing this," while another

12.2% (n=5) were “preparing to do this.” In terms of their self-efficacy for this behavior, 17.1% (n=7), 24.4% (n=10), and 53.7% (n=22) rated their level of confidence as 60%, 80%, and 100% respectively. The remaining three target behaviors were directly related to PC screening.

The second behavior referred to seeing a medical provider to discuss receiving a digital rectal exam. The participants were generally lower in terms of their stage of change for this target behavior relative to the first behavior before the intervention: there was an even spread from 14.6% and 17.1% in the pre-contemplation stage (“Not thinking about doing this”) and contemplation stage respectively (“Thinking about doing this”), to 14.6% in the preparation and action stages (“Preparing to do this” and “Less than 6 months”). The action and maintenance stage received the highest number of respondents at 13 (31.7%) for the second target behavior. Confidence for the second behavior before the intervention was rated generally high—the average confidence level was 67% and over 50% of respondents indicated that they were at least 80% confident in carrying out this behavior. The third target behavior was talking with a medical professional about screening for PC with a PSA exam, and once again we see an even distribution across categories in terms of the stage of change—all categories received between 5 and 9 responses, with the mean response being 2.95. In terms of confidence for the third target behavior, the respondents were generally confident that felt confident about communicating with a doctor about getting a PSA exam. The average confidence level was 74%, and only 4 respondents indicated that they were 20% or less confident on this behavior.

The fourth target behavior concerned spreading awareness of PC screening among African American men. On this behavior, we see a lower stage of change than we do for the other behaviors: the mean was 2.66 and almost 50% of the study sample was only in the pre-contemplation or contemplation stage. In terms of their confidence to carry out

this behavior, the study participants were again confident: the average confidence level was 69% and less than 10 of them reported having a confidence level of 40% or lower.

Discussion #5. Friedman et al. (2009) noted that health literacy skills exist "along a continuum progressing from basic functional health literacy (i.e., reading and comprehension skills), to interactive health literacy (i.e., personal skills involved in health information and help seeking), and finally to critical health literacy (i.e., individual and community capacity to use health information and be empowered to take control of one's health)" (p. 450). Again, by this definition, participants in this study who watched the video and chose to use the information they received to take control of their own health and to use health information for the good of the community, achieved "critical health literacy," the uppermost rung on the ladder of heath literacy, as per Friedman et al.

By and large, the sample of men who participated in this study were more formally educated, and therefore more literate, than the targeted population. Therefore, the concerns that Friedman et al. (2009) expressed about the correlation between low literacy and poor disease prevention were not as pertinent as they probably would have been if the sample were more representative of the targeted group. Nevertheless, their concerns are relevant to studies of this kind, and are worth noting:

> Individuals who cannot read and understand disease prevention information because of its difficult reading levels could be less likely to perceive risk to cancer and to attend to cues to action about prevention. Further, limited health literacy may reduce the accessibility and effectiveness of medical care, resulting in worse health outcomes. Improving health literacy and providing individuals with clear, plain language information are effective mechanisms to reduce health disparities and help people feel comfortable in taking an active role in their medical decisions. (p. 450)

Table 5c showed participants' self-reported behavior and confidence in spreading awareness among other African American men about the need for PCa screening. In the study conducted by Friedman et al. (2009), the authors noted that:

> Several men said they would "spread the word" about PrCA to family members and close friends as long as messages were consistent. While they

> requested information that was culturally specific and targeted to older AA men, having timely, accurate, and straightforward information was more of a priority. (p.456)

This finding is of interest in relation to the current study and has potentially actionable implications for future studies that seek effective ways to promote health literacy among African American men and reduce their incidence of and mortality rate from prostate cancer.

Summary and Discussion for Research Question #6: Dose of Exposure to Video (DOE-TV-1)

Summary #6. Asked how much of the Avatar video they had watched, 35 respondents (85.4%) said they watched the entire video, while six (14.6%) said that they watched most of it. No one replied that they had watched less than that.

Discussion #6. Thirty-five (85.4%) participants watched the entire video. Six (14.6%) watched most of it, and no one replied that they had watched less than half. This suggests the e-health intervention is a realistic approach to education African American men about PC.

Summary and Discussion for Research Question #7: Rate the Video (RTV-1)

Summary #7. When asked to rate the level of information they felt that the video presented, responses were generally positive. The mean response was 5.12, and over 75% of study participants rated the information shared by the video as wither very good or excellent.

Discussion #7. The positive response to the e-health intervention is meaningful. As Maibach and Parrot (1995) stated, “health messages that manage to establish new positive outcome expectations or to reinforce existing positive expectations, through demonstration or persuasion, are likely to increase people’s motivation for engaging in the relevant behavior” (p. 50). Furthermore, Rogers (1995) writes that “the easier it is for individuals to see the results of an innovation, the more likely they are to adopt it”

(Observability, para. 2). This suggests that the high rating of the avatar e-health intervention may mean that those who watch the video are likely to adopt the behaviors regarding PC screening.

Summary and Discussion for Research Question #8: Prostate Cancer Screening Empowerment Scale Measuring Stage of Change and Self-Efficacy for Four Behaviors—Post-video (PCS-ES-M-SOC-SE-POST-V-4)

Summary #8. The eighth research question concerned stages of change and self-efficacy of four target behaviors (getting an annual physical exam, discussing with medical provider about screening for PC with a digital rectal exam, discussing with medical provider about screening for PC with a PSA test, and spreading awareness of PC among African American men) *after* watching the video. The average stage of change for the first target behavior of getting annual physical examinations was 3.95—over 50% of respondents (n=22) reported that they had been doing this behavior for more than 6 months. Confidence levels were very high in terms of carrying out this behavior—the mean confidence level was 87%. The remaining three target behaviors were directly related to PC screening.

Regarding the second target behavior of working with a medical professional to consider receiving a digital rectal exam to screen for PC, the mean response in terms of the stage of change was 3.32. Ten participants (24.4%) remained in the pre-contemplation or contemplation stage, while twelve indicated they were preparing to discuss the possibility of receiving a digital rectal exam with a medical professional. Participants were fairly confidence they could carry out this target behavior: the mean confidence level was 77% and nearly 70% reported having a confidence level of at least 80%. When asked about discussing whether or not to get a PSA exam to screen for PC post-intervention, about 20% (n=9) remained in the pre-contemplation or contemplation stage. The modal response post-intervention was the preparation stage (n=16; 39.0%).

The study participants were also confident they could communicate with a doctor about receiving a PSA exam: the mean response was 81%.

In terms of the fourth target behavior, spreading awareness among AA men regarding PC screening, the mean stage of change was 2.95, with the majority of respondents falling in the contemplation stage (n=12; 29.3%) and preparation stage (n=17; 41.5%). Most respondents were confident they knew how to spread awareness of PC screening—the average confidence level was estimated at 78%.

Discussion #8. Overall, the Avatar video had a positive effect on the behaviors and self-efficacy of many of the participants. In terms of ability, the third and fourth target behaviors were positively affected by the intervention, while confidence was increased for the second, third, and fourth target behaviors (the three behaviors specifically focused on PC screening). This suggests that a simple avatar video can motivate improvements in the stage of change and self-efficacy for health-related behaviors. In sum, the avatar e-health intervention may have reinforced the target behaviors regarding screen for prostate cancer, something which Chan et al. (2011) have previously identified as underappreciated necessity among minority populations.

Summary and Discussion for Research Questions #9 & #10: Movements in Stages of Change and Self-Efficacy to Perform the Four Target Behaviors

Summary #9 and #10. Parts IX and X of this study compared responses both before and after the avatar video intervention to see the e-health intervention was associated with movements in the stage of change or self-efficacy for the four target behaviors. A change score was calculated as the difference between the post- and pre-intervention score, a paired t-test was then conducted to check for statistical significance.

The first target behavior (getting annual physical exam) was the lone behavior that was not explicitly related to PC screening, and this study found no significant differences in the stage of change (d =.015, p-value = .868) or in self-efficacy (d =.133, p-value = .418). The intervention did not lead to an improvement in the stage of change for second

behavior of discussing the merits of receiving a digital rectal exam (*d* =.000, p-value = 1), though self-efficacy significantly increased (*d* =.354, p-value = .005) for this target behavior. The stage of change (*d* =.306, p-value = .041) and self-efficacy (*d* =.302, p-value = .020) of the behavior discussing the possibility of receiving a PSA exam to screen for PC were both significantly affected by the intervention. Similarly, when it came to the behavior of spreading awareness among African American men, the intervention increased the stage of change (*d* =.234, p-value = .032) and self-efficacy (*d* =.327, p-value = .005 of this behavior.

Discussion #9 and #10. Interestingly, getting an annual physical exam remained unchanged due to the intervention. This could be because receiving physical examinations is a rather routine procedure, and one that is hardly limited to those at risk of having PC. In the United States, receiving frequent physical examinations is almost universally acknowledged as an important tool to leading a healthy life style. Give this reality, it is not surprising that the participants in this study were found to be in the action stage of doing this behavior before the intervention occurred, thus explaining why a significant improvement in this behavior was not observed. This same logic applies to their confidence in getting a physical exam.

The last three target behaviors were all directly tied to getting screened, or spreading awareness about getting screened, for prostate cancer. The e-health intervention created in this study significantly improved the stage of change in two of three target behaviors: getting a PSA exam and spreading awareness about the need for PC screening. Self-efficacy for all three target behaviors regarding PC screening was significantly improved by the e-health video. This is encouraging news, as other scholars like Chan et al. (2011) have specifically discussed the barriers to getting screened for PC among minority populations. Furthermore, it has been demonstrated that people who perceive a greater perceived benefit of PC screening are actually more likely to get screened (Tingen et al., 1998).

As per Friedman et al. (2009), numerous men said that they would use PrCA prevention information as a motivator to change their own behaviors. “Messages that motivate AA men to take action and communicate pertinent information to others will help decrease negative perceptions about cancer prevention in the AA community and encourage routine engagement in prevention, screening, and healthy lifestyle behaviors (pp. 457-458).

Summary and Discussion for Research Question #11: Relationship Between Demographic Variables and other Study Scales with the Target Behavior of Going to Get a PSA Test to Screen for Prostate Cancer (Pre-measure)

Summary #11. A number of study variables were correlated with the third target behavior of discussing whether one should receive a PSA exam to screen for PC with a medical professional. In terms of participants’ demographic characteristics, age (ρ=.442, p-value = .004) and education (ρ=.324, p-value = .041) were significantly related to the third target behavior, while income was not. Most of the health status variables were not significantly related with the behavior of discussing getting a PSA exam with a medical provider, including overall health status, BMI, weight self-rating, overall quality of medical care, and the perceived sensitivity of medical providers to treating African American males. Of the health status variables, only quality of care for the participants’ medical condition was significant (ρ=.324, p-value = .044). Finally, this study also considered associations between participant health literacy skills and self-efficacy.

In terms of health literacy skills, the ability to seek out health information (ρ=.490, p-value = .001), seeking out health services (ρ=.439, p-value = .005), and thinking about what a health provider has communicated with them (ρ=.382, p-value = .015) were all significant. The remaining health literacy behaviors were not associated with the third target behavior in study. In terms of self-efficacy for the health literacy behaviors, seeking out health information (ρ=.560, p-value < .001), seeking out health services (ρ=.409, p-value = .009), thinking about what a health provider has communicated with

them (ρ=.377, p-value = .016) and understanding what a health professional has told them (ρ=.337, p-value = .033) were all significantly related to the third target behavior. Ability and self-efficacy of four health literacy behaviors did not correlate with the target behavior at all: communicating with a health care professional, memorizing and repeating out loud what a health professional told them, asking follow up questions to understand what they were told by a medical provider, and making the best health decision for oneself.

Discussion #11. Schwartz et al. (2004) find that most adults in the U.S. believe regular prostate cancer is important, and that this preventative behavior can save lives. This study showed that among the African American community, age and education are both positively associated with the behavior of going to get screened for PC with a PSA test. The findings that health literacy skills and self-efficacy are significantly related getting screened for PC with a PSA exam support other literature that finds health literacy and health outcomes are linked (Berkman et al., 2011).

Summary and Discussion for Research Question #12: Predicting the Target Behavior of Going to Get a PSA Test to Screen for Prostate Cancer (Pre-Measure)

Summary #12. A series of regression models were fit to explore how a subset of participant demographic, health status, and health history variables were related to the behavior of talking with a medical professional about receiving a PSA exam to screen for PC (Q.61).

The first model that included a subset of demographic variables (age, married, income, education) had an R^2 of .359 and turned up two demographic variables that were significantly related with Q.61: age (p-value = .011) and education (p-value = .015). Income and being married were not significantly related to Q.61, with the estimate effect of income being essentially 0 (β = 0.00).

Model 2 included a set of health status variables: overall self-reported health, BMI, weight self-rating, private insurance, quality of health care for medical condition, quality

of medical care from provider, and sensitivity of primacy care provider for treating African American males. R^2 for this model was .391, and four of the health status variables had significant relationships with the dependent variables: overall health status (p-value = .015), having private insurance (p-value = .027), overall quality of care for medical condition (p-value = .002), and overall quality from primary care provider (p-value = .032). BMI, weight self-rating, and sensitivity of primary care provider were not found to be significantly related to Q.61.

With an R^2 of .618, model 3 had the strongest association with the behavior of discussing with a medical provider the prospects of getting screened via a PSA exam for PC. Two variables were significant in this model: previously getting a digital rectal exam (p-value = .002) and being screened for PC by a doctor (p-value = .002). Being at risk of getting PC and having a family member die from PC was not associated with Q.61.

The fourth and final model estimated for Q.61 was a backward stepwise regression that included all of the independent variables included in the first three models. In the end, this procedure converged on a solution with four variables, all of which were significant: BMI, having private insurance, having a previous digital rectal exam, and getting screened for PC.

Discussion #12. In the model with demographic variables, age and education both predicted the behavior of going to get screened for PC with a PSA test. This suggests that improving retention in educational settings is one long-way strategy of encouraging African American males to get screened for PC—something that Weinrich et al. (2009) previously found. In their study, they find that an educational intervention improved the chances that African American men, who actually have higher mortality rates from PC than Whites do, will get screened for PC. Unlike Tingen et al. (1998) found, being married was not significantly associated with getting screened for PC—which could be due to the small sample size used in this study.

In the model 2, there were a few variables that were significantly related to the behavior of getting a PSA test to screen for PC. As Potosky et al. (1998) found, having medical insurance, and particularly private insurance, was found to increase the odds of being screened for prostate cancer. As we would expect, higher ratings of medical care from the participants' health care provider was associated with getting screened for PC via PSA exam. The negative association of overall health and getting screened for PC with a PSA test is difficult to explain, it could be that healthier individuals are less likely to go and get screened for any potential diseases.

In terms of health history, pervious research has found that having a family history related to prostate cancer vulnerability was related to undergoing screening (Jacobsen et al., 2003). The third model, however, found that family history was not predictive of the getting a PSA exam to screen for PC, and nor was being at risk of PC a predictor of getting screened via PSA exam. As we would expect, there was a very strong association between getting screened by a doctor for PC and receiving a digital rectal exam to screen for PC.

Summary and Discussion for Research Question #13: Intention to Engage in Diffusion of the Innovation of Watching the Avatar Video (DIWV-2)

Summary #13. Part XIII of this study concerned the participants' intention to spread awareness about the avatar video that was used as the study's intervention. Of the 41 study participants, 39 (95.1%) said they were going to recommend the avatar video to other men. The open-response questions largely agreed with this finding: most participants found the video informative and clear, and thought the video was well worth the time they spent watching it.

Discussion #13. The majority of study participants said they would recommend the avatar e-video to other African American men, and that the video was informative and helpful. The respondents also suggested that the video was indeed culturally appropriate for the intended population. Misra and Wallace (2012) have noted that carefully crafted

e-health interventions on the web can not only be effective, but can allow for wider access to essential health-related information. The respondents clearly support that conclusion since the majority of them indicated that they intended to share the avatar e-resource with other African American men.

Implications

This study has examined the potential of culturally appropriate e-health videos to reach and engage African American men vis-à-vis their heightened risk of developing prostate cancer, and the screening and treatment options available to them. The findings indicate that the culturally tailored avatar that was created for and presented to these African American men—a group that has been historically difficult to reach—positively impacted their behavior. It is incumbent upon health educators and researchers to continue to design, administer, and study the effects of such avatars. This will serve both the health needs of this at-risk population and may reduce the overall incidence and costs associated with prostate cancer. Given the epidemic proportion of PCa in the U.S. and its disproportionate incidence in African American males, and the promising results of this study, the innovative use of e-health avatar videos should be pursued. Culturally tailored avatars have not only been shown to be effective—they are low-tech, relatively inexpensive, readily accessible, and easily disseminated. Moreover, the men who responded positively to watching the avatar were also willing to recommend it to other men within their social networks. Such willingness and engagement should make the potential reach and positive effect of these avatars of serious interest to other health educators. Avatars have been shown, through this study and others conducted by fellows of the Research Group on Disparities in Health (RDGH) at Teachers College, Columbia University, sponsored by Professor Barbara Wallace, Director of the RGDH, to be effective tools in engaging at-risk and difficult-to-reach populations. In addition, they are

a viable and low-cost way to engage and positively affect vulnerable populations—in this case, African American men who face a disproportionate risk of developing PCa and its complications.

This study therefore signifies the importance of having health educators use culturally appropriate videos to reach this at-risk population—African American men—which has proven difficult to reach by other means, and to use innovative e-health in as wide a variety of community-based settings as possible, such as health clinics. I addition, such culturally appropriate materials could be highly effective in reaching this population through social networks and organizations for African American men.

The implications of this study also include ramifications for the larger society. Because African American men comprise a disproportionate percentage of the men affected by the epidemic of PCa, and while tending to be less aware of this risk and less engaged in their healthcare, finding effective ways to address and disseminate information and ways contains the possibility of reducing the incidence of PCa in African American men and thereby reduce, too, the societal costs associated with it.

Recommendations for Future Research

Existing research on the disproportionate incidence and severity of PCa in black men indicates the need for future research in several areas. First, genetics has been identified as playing a definitive role in this racial disparity. Second, as Woods et al. (2004) found, in their longitudinal study of 277 Black men in the U.S., that the men did not participate in PCa screening. The reasons for this lack of participation raise a whole other avenue of needed research, especially in the light of the “epidemic” of PCa in American black men that the U.S. Congress declared in 2012.

In relation to both the importance of genetics and the socio-cultural reasons why black men tend not to participate in PCa testing, Hoffman et al. (2001) recommended that

future research "be directed at the identification of biologic markers and genetic susceptibility factors, as well as additional socioeconomic factors, including use of health-care systems, distance from health care, diet, literacy, and health beliefs" (p. 394). Fowke et al. (2005) noted that assessing the "relationships between prostate cancer screening and social support structures, self-efficacy to make health care decisions, and individual perceptions of health and disease might help address these issues" (p. 339), while Woods et al. (2004) were more specific in reporting the conclusions and recommendations of their study:

> Five themes were identified as critical elements affecting men's screening for prostate cancer: lack of knowledge, communication, social support, quality of care, and sexuality. These themes were associated with a sense of disconnectedness by black men from the healthcare system and contributed to nonparticipation in prostate cancer early detection activities. (p. 388)

Based on these findings, Woods et al. (2004) concluded that "lack of discussion about the decision to screen for prostate cancer and general lack of culturally appropriate communication with healthcare providers has engendered distrust, created fear, fostered disconnect, and increased the likelihood of nonparticipation in prostate cancer screening among black men" (p.388). They recommended creating "a caring, trusting, social environment … a positive relationship with the physician/healthcare provider … and outreach using respected older men and family members" to address these issues, all of which are "consistent with other researchers who have identifies core black values and traits" (p. 395). "To more effectively reach black men," they state,

> we recommend a combination of culturally attractive materials, cultural sensitivity (including an acknowledgment of past negative experiences of this group with healthcare), and competent, person-oriented quality service delivery. Most important is the need for a "personal touch"—a relationship between the provider and the men. (p. 388)

In line with these recommendations, the current study provided "culturally attractive materials" as an attempt to engage a group of African American men in

thinking about their risk for PCa, their options for taking a proactive stance in diagnosing this risk, and their options for care. Future research needs to follow up on the findings of the present study and other studies, which have shed light not only on the genetic predisposition of Black men to develop PCa and the reasons why Black men have historically not participated in PCa discussion and screening—but have proposed ways to address the social reasons for this lack of participation. Studies can now be conducted that utilize the recommendations of this research to see whether their implementation produce positive results, and to what degree.

In addition, studies that address the genetic predisposition of Black men to develop PCa can be conducted to determine whether, in the light of the known benefits of genetic testing and the lack of risk involved (unlike PSA testing), more routine genetic testing would serve Black men in this regard (as is now offered to women who have a family history of and genetic predisposition for breast cancer).

Specifically, as Wu and Modlin (2012) stated, “Chromosome 8q24 variants have been shown in several studies to be associated with prostate cancer risk and are more common in African American men” (p. 314). Wu and Modlin also pointed to “a higher rate of variations in cell apoptosis genes such as *BCL2*11 and tumor suppression genes such as *EphB2* in African American men” (p. 314).

Wu and Modlin (2012) discussed how evidence of a “genetic component to the high incidence and mortality rate in African American men comes from epidemiologic studies of men with similar genetic backgrounds” (p. 314). In their words, “Chromosome 8q24 variants have been shown in several studies to be associated with prostate cancer risk and are more common in African American men” (p. 314). Wu and Modlin also pointed to “a higher rate of variations in cell apoptosis genes such as *BCL2*11 and tumorsuppression genes such as *EphB2* in African American men” (p. 314). Wu and Modlin discussed how these findings “suggest that genetic differences may contribute to

the higher prostate cancer incidence and mortality rate seen in African American men" (p. 314).

Freedman et al. (2006) conducted a study to "explore how much of the increased incidence of prostate cancer in African-American men might be explained by African (as compared with European) ancestry at 8q24" (p. 14070). To determine this, they studied 1,597 prostate cancer cases and 873 controls, and "evaluated the risk for individuals carrying zero, one, and two chromosomes with African ancestry" at the 8q24 locus (p. 14070). They concluded that "8q24 explains a large proportion of prostate cancer in younger African Americans" (p. 14071), and stated:

> If it were possible to develop a treatment that reduced prostate cancer risk in the African-American population to the level that is seen in men who carry two copies of 8q24 inherited from recent European ancestors, the rate of prostate cancer would decrease by 49%. (p. 14070)

Mahal et al. (2014) examined trends in disparate treatment of African American (AA) men with localized prostate cancer (PCa) across National Comprehensive Center Network (NCCN) risk groups in the United States. According to Mahal et al., "African American (AA) men have a significantly higher risk of dying from PCa than white men" (p. 386). How much of this, they added, "is due to differences in biology vs disparities in treatment patterns and access to care," is unknown (p. 386).

Given the dangers known to be inherent in PSA testing, it would be important for future biomedical research to undertake the discovery of alternate forms of PCa screening that do not involve these (or other) risks. Such medical research might consider ways to use gene BCL2, chromosome 8q24, and/or gene EphB2 to develop new methods for diagnostic screening that do not carry the risks or uncertainties that are involved in current PSA testing. In addition, the development of a genetically based treatment that addresses the finding of Freedman et al. (2006) might result in the kids of reduction in a 49% reduction in the incidence of PCa (p. 14070). These are all efforts worthy of additional research.

Disparities in the treatment and survival rates of African American men are another avenue in need of further research and change. Research has already acknowledged this disparity. Wu and Modlin (2012) also note that research has shown differences "in the treatments offered to patients, which in turn negatively affect survival" (p. 316). The treatments highlighted were "potentially curative local therapies (including radical surgery or radiation)" that "may be recommended less often to black men because of major comorbidities or socioeconomic considerations" (p. 316). One potential for future research is trying to expand the findings of this study to a lower socioeconomic sample since this study oversample individuals from higher socioeconomic backgrounds as measured by income and education.

Given the well-established disparities in both the genetic disposition for and the treatment of PCa in African American men, our currently incomplete understanding of how variants in chromosome 8q24 affect the development of PCa, and more specifically how treatment disparities affect outcomes in African American men, it is incumbent upon future research to follow up on these topics and determine how best to develop and implement strategies designed to address them.

Hoffman et al. (2001) recommended that future research "be directed at the identification of biologic markers and genetic susceptibility factors, as well as additional socioeconomic factors, including use of health-care systems, distance from health care, diet, literacy, and health beliefs" (p. 394). On the other hand, Fowke et al. (2005) suggested that the assessment "of relationships between prostate cancer screening and social support structures, self-efficacy to make health care decisions, and individual perceptions of health and disease might help address these issues" (p. 339).

On a different level, utilizing the PCS-10 scale that was created for this study by the Principal Investigator and dissertation sponsor, Dr. Wallace, makes it possible to obtain the prevalence of diagnoses of prostate cancer, history of screening for prostate cancer (i.e., with yes, no, or unsure options), as well as the prevalence of prostate cancer

in men's family and in their social network (i.e., check all that apply)—including deaths from prostate cancer and the metastasis of cancer in their network (i.e., number indicated). In future research, it would be optimal to use this new tool as the standard for obtaining and determining data on these specifics.

Limitations

The limitations to this study are as follows: (1) the use of self-reported data that is not validated, including the risk that participants provided potentially socially desirable responses (since no measure of social desirability is being used in this study); (2) the manner in which study subjects need to have access to computers and the internet to complete the study; (3) the potential time burden on study participants given the study task, even though the Principal Investigator attempted to limit the length of study participations; and (4) the difficulty of engaging a stigmatized, hard-to-reach population of African American men at risk for prostate cancer, which may have limited the sample size. Moreover, the fact that the study used a sample of convenience limits its generalizability, as does the fact that volunteers were used who may have certain characteristics (e.g., greater than usual interest in prostate cancer). Finally, the fact that all data were collected at a single point in time, and only through online sampling, makes it impossible to determine whether or what additional changes might occur over time in the subjects' behavior.

While these possible sources of bias exist, however, the findings of this study indicate that it culturally tailored and appropriate videos, such as avatars, have significant implications for following up with other such initiatives to communicate with and inform African American men about their risk for PCa, and their options for screening and treatment. Innovative e-health has been shown to be a viable tool in advancing the need

to reach this population and improve their chances of early detection and better care in relation to prostate cancer.

Finally, a major limitation concerns the study sample. As has been stated, this study oversampled from an upper socioeconomic group of people. The median income was approximately 80,000, while the median years of schooling completed was 16—meaning that half of the study participants at least had completed college. This impacts the generalizations that this study can claim—more research will be needed to show that the results of this study, and particularly the impact of the intervention, generalized to more underserved populations.

Conclusion

Chapter I introduced the study. The subsequent chapters provided a literature review (Chapter II), study methods employed (Chapter III), results of the data analysis (Chapter IV), and a discussion of the results, with implications and conclusions (Chapter V).

Because African American men (1) face a disproportionately great risk of developing prostate cancer and developing/dying from comorbidities associated with PCa, (2) live with a significant disparity in their receipt of healthcare, and (3) are relatively uninformed and unaware about their risks and healthcare options, there is a pressing need to develop culturally appropriate tools that can engage this population of men in preventing and treating PCa, and to develop and prioritize strategies that integrate biomedical and behavioral approaches to PCa diagnostic screening and intervention strategies. Furthermore, society could benefit from additional NIH funding in the area of prostate cancer research regarding African American men. Additionally, increasing the number of African American scholars that focus on the prostate cancer dilemma in the

African American community would produce more strategies to decrease the incidence and mortality rate from PC among African American men.

This study has identified important next steps that can be used to advance our knowledge of PCa in African American men; and the viability of innovative, culturally appropriate e-health products as valuable health education tools. These findings therefore serve to inform both public-health educators, and both biomedical and social researchers, moving forward.

The following quote from Woods et al. (2004) sums up the medical and cultural need that must be addressed to produce a significantly positive impact on the current disparities faced by African American men in relation to PCa:

> Black men's lack of engagement with the healthcare system in general and more specifically in prostate cancer screening occurs within a larger societal context. Black men have historically been dissuaded from active and meaningful participation as a partner in their own health care. Disconnectedness of black men from society has persisted for a long time, and healthcare is no exception. To improve the lagging health status of black men, health professionals must utilize strategies that reach, engage, and sustain relationships with this population.… Consideration of their ethnic origin will enhance our ability to reach disenfranchised black men more effectively and will help to close the health disparity gap. (p. 394)

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Appendix A

Informed Consent

Teachers College, Columbia University

New York, New York

INFORMED CONSENT

DESCRIPTION OF RESEARCH:

As a health professional (MPH) and pre-doctoral fellow with the Research Group on Disparities in Health within the Department of Health and Behavior Studies at Teachers College, Columbia University, in New York, New York, I am also working with my sponsor (Dr. Barbara Wallace) on this study. We are studying how African American men evaluate and rate a brief Avatar (cartoon-like) video on prostate cancer, while also obtaining important background information through a survey. Our goal is to use what we learn from this study to share information on the health education needs of African American men.

Study Location: The research is being conducted online. Participants can only access the study by following the study link. This can be done wherever the participant has access to a computer and the Internet.

RISKS AND BENEFITS:

Potential Risks: There are no anticipated risks to participants in this study. When answering questions in this study, some participants might experience embarrassment, discomfort, emotional pain, sadness, or stress. This is a risk of answering some survey questions. Although, we would encourage study completion, a participant can discontinue participation in this study at any time. Simply exit the study, and delete the link to the study. Any participant who becomes upset can pursue help, as follows, as an Internet user: conduct a search via Google.com by entering "free online counseling." For example, go to http://www.myshrink.com/online-crisis-counseling-t.php and access support 24 hours a day/seven days a week from a trained professional volunteer; or, go to http://www.psychresources.net/ to access online counseling resources; or, go to http://www.mytherapycouch.com/free_online_therapy/ to receive free online therapy with a qualified professional. Again, we do not think that study participation will trigger so much discomfort that this is necessary. But, we offer these suggestions just in case you do experience discomfort.

Remember, participation in this study is completely voluntary. Participants can end their involvement in the study at any time. Simply exit the study, and delete the link to the study.

There is another risk for study participants. Participants may experience feelings of fatigue, frustration, or boredom while answering survey questions. We have taken steps to minimize this risk. We did this by selecting only the most important questions. And, we attempted to limit the amount of time it takes to answer questions.

There is another potential risk. This involves feeling influenced by someone or pressured to participate in the study. No participant should feel forced or pressured to be in the study. The use of an online survey means that the researcher has no way of knowing who actually took the survey and who did not. This reduces/minimizes the risk

of your feeling coerced, pressured, or forced to participate in the study. Remember, you can discontinue study participation at any time. Simply exit the survey and delete the link to the survey.

Potential Benefits: There are no direct benefits for study participants. No benefits from study participation are being promised or guaranteed. Some potential benefit is possible.

For example, as a part of this study, a participant may experience a benefit from watching the video. A positive benefit is expected. However, no positive benefit is guaranteed. There is no way of knowing if any negative consequences follow from viewing the video. Again, no positive benefit is guaranteed.

PAYMENTS:

There are no payments for participating in this study. However, a participant has a 3 in 200 chance of winning a $300, $200, or $100 gift certificate to www.Amazon.com. Once 200 participants complete the entire survey, a program will automatically send out bar-coded gift certificates to 3 randomly chosen e-mail accounts. This happens without linking participants to their survey answers.

DATA STORAGE TO PROTECT CONFIDENTIALITY:

Since this is an online survey, actual names, addresses and phone numbers are not needed. Only aggregate (group) data will be used by the researchers. The designers of the website have taken steps to ensure that all data will remain secure, private and confidential.

TIME INVOLVEMENT:

Study participation should take about 45 minutes. First, you will be asked to answer survey questions for about 30 minutes. Next, you will be asked to watch an Avatar (cartoon-like) video for about 5 minutes. Finally, you will be asked to answer additional questions, including rating the videos—taking about 10 minutes.

HOW RESULTS WILL BE USED:

The results of the study will be used in health education. This includes improving health education created to meet the needs of African American men, and improving our Avatar (cartoon-like) videos. The results will also be used as part of dissertation data for the researchers' doctorate degree in health education. The data will be presented at health education meetings, published in health education journals, and used for other educational purposes.

THIS STUDY'S IRB PROTOCOL NUMBER: 115125

Appendix B

Participant's Rights

Teachers College, Columbia University

New York, New York

PARTICIPANTS' RIGHTS

Principal Investigator: WILLIAM HALL
Research Title: AN INNOVATIVE APPROACH TO REDUCING PROSTATE CANCER HEALTHCARE DISPARITIES FOR AT-RISK AFRICAN AMERICAN MEN: DEVELOPMENT AND EVALUATION OF AN ONLINE E-HEALTH AVATAR VIDEO TAILORED TO BE CULTURALLY APPROPRIATE

- I have read and discussed the Research Description. I have had the opportunity to ask questions about the purposes and procedures regarding this study.
- My participation in research is voluntary. I may refuse to participate or withdraw from participation at any time without jeopardy to future medical care, employment, student status or other entitlements.
- The researcher may withdraw me from the research at his/her professional discretion.
- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue to participate, the investigator will provide this information to me.
- Any information derived from the research project that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- If at any time I have any questions regarding the research or my participation, I can contact the investigator, who will answer my questions. The investigator's e-mail is wah47@tc.columbia.edu and his sponsor/ supervisor (Dr. Barbara Wallace) can be contacted at bcw3@columbia.edu or 267-269-7411.
- If at any time I have comments, or concerns regarding the conduct of the research or questions about my rights as a research subject, I should contact the Teachers College, Columbia University Institutional Review Board /IRB. The phone number for the IRB is (212) 678-4105. Or, I can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY, 10027, Box 151.
- I should receive a copy of the Research Description and this Participant's Rights document.
- NOT APPLICABLE: If video and/or audio taping is part of this research, I ( ) consent to be audio/video taped. I ( ) do NOT consent to being video/audio taped. The written, video and/or audio taped materials will be viewed only by the principal investigator and members of the research team.
- NOT APPLICABLE: Written, video and/or audio taped materials ( ) may be viewed in an educational setting outside the research ( ) may NOT be viewed in an educational setting outside the research.

- My ELECTRONIC signature means that I agree to participate in this study.

Participant's ELECTRONIC assent: ___Yes I reviewed my Participants Rights__
Date:____/____/____

THIS STUDY'S IRB PROTOCOL NUMBER: 115125

Appendix C

Screening for Study Participation

SCREENING QUESTIONS FOR THE AFRICAN AMERICAN MEN'S PROSTATE CANCER AWARENESS AVATAR VIDEO STUDY

Thank you for volunteering to participate in the **African American Men's Prostate Cancer Awareness Avatar Video Study**. Before you begin, please answer the following questions:

1) Are you an African American man who is age 18 or older?
Yes ___ No___

2) Are you able to read and understand English on a high school level?
Yes ___ No___

3) Are you able to devote about 25-35 minutes to this study at this time—for a 3 in 200 chance to win a $300, $200, or $100 gift certificate for use on www.Amazon.com?
Yes___ No___

6) More specifically, are you willing to spend 10-15 minutes answering a survey?
Yes___ No___

7) Next, are you willing to watch an avatar video (cartoon) for about 5 minutes?
Yes___ No___

8) Are you willing to answer another set of questions for about 5-10 minutes, including rating the avatar videos and explaining why you would or would not recommend the video to others?
Yes___ No___

If you answered NO to any of the eight above questions, then please STOP HERE. This study opportunity is not for you. Please forward the study link to people you think are able to answer YES to the above questions. E-mail, text, or tweet for them to:

Go to www.surveymonkey.com/s/AAProstateCancer/ to take a survey & rate a video for a chance to win a $300, $200, or $100 prize.

Or, you can return to this survey when you have the time to devote to it.

If you answered YES to all of the above questions, then please proceed to the next set of questions.

Appendix D

Study Survey

SURVEY FOR THE AFRICAN AMERICAN MEN'S PROSTATE CANCER AWARENESS AVATAR VIDEO STUDY

Instructions: Please answer the following questions in each section by clicking the box next to the item of your choice.

PART I: BASIC DEMOGRAPHICS (BD-9)

1) I am: A. □ Female B. □ Male

2) My age is: _____ (USE DROP DOWN MENU OF AGES 18-85)

3) I am currently: A. □ Married B. □ Divorced C. □ Separated
D. □ Widowed E. □ Never Married F. □ In Domestic Partnership
G. □ Living with Significant Other H. □ In a Committed Relationship
I. □ Currently Dating Other _____

4) My race/ethnicity is as follows: (Please mark all that apply)
__Black/African American
__White / Caucasian / European American
__Hispanic / Latino (including Puerto Rican, Mexican, Mexican American, Chicano, Cuban, other Spanish)
__Asian (Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, or other Asian)
__American Indian / Alaska Native
__Native Hawaiian / Pacific Islander
__Arab American / Middle Eastern
__Other group(s) (specify)

5) Do you live in the United States? □Yes □No
If yes, what is your current zip code? _____
If No, what country do you live in? _____

6) Were you born in the United States? □Yes □No
If answered "No, "Where was you place of birth or your country of origin?
Country of origin? _____
(USE DROP DOWN MENU OF COUNTRIES)

7) My yearly household income is:
__Less than $10,000
__$10,000 to $19,000
__$20,000 to $39,000
__$40,000 to $49,000
__$50,000 to $99,999
__$100,000 to $199,999
__$200,000 to $299,000
__$300,000 to $399,000
__$400,000 to $499,000
__$500,000 to $799,000
__$800,000 or More
__I do not know

8) My highest education level is:
- Grade School (please indicate your grade completed) _____
- High School
- Associate Degree
- Bachelors Degree
- Masters Degree
- Doctoral Degree
- Other Degree (please explain) _____

9) I am currently (check all that apply)
__ part-time undergraduate student
__ full-time undergraduate student
__ part-time graduate student
__ full-time graduate student
__ unemployed
__ on Welfare
__ Employed Part-time
__ Employed Full-time
__ Receiving SSI/SSD
__ Other (please explain_____)

PART II: BRIEF HEALTH SURVEY (BHS-8)

1. I rate my overall health status as
a.___Excellent b.___Very Good c.__Good d.__Fair
e.__Poor f.__Very Poor

2) My height is _____ feet _____ inches

3) My weight is _____ pounds

4) I consider myself to be
a). ___underweight b)___normal weight c)___overweight d)____obese

5) My type of medical insurance is (check all that apply)
a) Private insurance plan (e.g. Blue Cross/Blue Shield, Aetna, Oxford, etc…)
b) HMO
c) Medicaid
d) Medicare
e) Not Applicable, I have no medical insurance

6) I rate the overall quality of care I receive for my health (and any medical condition I have) as
a.___Excellent b.___Very Good c.__Good d.__Fair
e.__Poor f.__Very Poor g.___Not Applicable (don' t receive health care)

7). I rate the overall quality of care I receive from my primary care physician as
a.___Excellent b.___Very Good c.__Good d.__Fair
e.__Poor f.__Very Poor g.___Not Applicable (I do not have one)

8) For my health care providers showing sensitivity and competence for treating me as an African American, or providing me with the same care they provide to Whites, I rate them as
a.___Excellent b.___Very Good c.__Good d.__Fair
e.__Poor f.__Very Poor g.___Not Applicable (I do not receive any health care)

PART III: PROSTATE CANCER SCALE (PCS-10)

1-Have you ever been told by a doctor or medical professional that you have prostate cancer?
__No __Yes __Unsure

2-Have you ever been told by a doctor or medical professional that you are at risk for prostate cancer?
__No __Yes __Unsure

3-Have you ever had a doctor or medical professional perform a digital rectal examination (placing their finger in your anus/rectum)?
__No __Yes __Unsure

4-Have you ever been told by a doctor or medical professional that you were going to have your PSA measured?
__No __Yes __Unsure

5-Have you ever been told by a doctor or medical professional that you were being given a screening test for prostate cancer?
__No __Yes __Unsure

6-Do you know someone in YOUR FAMILY who has been diagnosed with prostate cancer?
__No __Yes __Unsure
If you answered "Yes," then please check off all those you know in YOUR FANILY who have been diagnosed with prostate cancer:
____Maternal grandfather (grandfather on your mother's side)
____Paternal grandfather (grandfather on your father's side)
____Father
____Uncle on your mother's side ___More than one Uncle on mother's side
____Uncle on your father's side ___More than one Uncle on father's side
____Cousin on your mother's side ___More than one Cousin on mother's side
____Cousin on your father's side ___More than one Cousin on father's side
____Brother ___More than one Brother? __Yes __No If Yes, how many?
____Other (please explain_____)

7-Do you know someone in YOUR FAMILY who DIED from prostate cancer?
__No __Yes __Unsure
If you answered "Yes," then please check off all those you know in YOUR FANILY who DIED from prostate cancer:
____Maternal grandfather (grandfather on your mother's side)
____Paternal grandfather (grandfather on your father's side)
____Uncle on your mother's side ___More than one Uncle on mother's side
____Uncle on your father's side ___More than one Uncle on father's side
____Cousin on your mother's side ___More than one Cousin on mother's side
____Cousin on your father's side ___More than one Cousin on father's side
____Brother ___More than one Brother
____Other (please explain_____)

8-Do you know someone who has been diagnosed with prostate cancer?
__No __Yes __Unsure
If you answered "Yes," then please indicate the number of people you know who have been diagnosed with prostate cancer:
____0 ____1 ___2 ____3 ____4 ____5 ____6 ____7 ____8 ____9 ___10

9—Do you know someone who DIED from prostate cancer?
__No __Yes __Unsure
If you answered "Yes," then please indicate the number of people you know who have DIED from prostate cancer:
____0 ____1 ___2 ____3 ____4 ____5 ____6 ____7 ____8 ____9 ___10

10—Do you know someone who DIED from prostate cancer that had also spread (metastasis) to other parts of their body?
__No __Yes __Unsure
If you answered "Yes," then please indicate the number of people you know who have DIED from prostate cancer that had also spread (metastasis) to other parts of their body?
____0 ____1 ___2 ____3 ____4 ____5 ____6 ____7 ____8 ____9 ___10

PART IV: SCALE MEASURING HEALTH LITERACY VIA SKILLS AND SELF-EFFICACY (SM-HL-V-S-SE-16)

The CDC has defined health literacy, as follows: "The Patient Protection and Affordable Care Act of 2010, Title V, defines health literacy as the degree to which an individual has the capacity to obtain, communicate, process, and understand basic health information and services to make appropriate health decisions" (para. 1).

Please answer the following questions:

For seeking out health information,
1-I would rate my ability as

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

2-And, I would rate my level of confidence for doing this as

Not confident					Extremely confident
0%	20%	40%	60%	80%	100%

For seeking out health services, such as going to a clinic, hospital, or making an appointment to see a medical doctor in their office
3-I would rate my ability as

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

4-And, I would rate my level of confidence for doing this as

Not confident					Extremely confident
0%	20%	40%	60%	80%	100%

For communicating with a health professional and asking all the questions that I have about my health
5-I would rate my ability as

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

6-And, I would rate my level of confidence for doing this as

Not confident					Extremely confident
0%	20%	40%	60%	80%	100%

For thinking about what I have been told by a health professional and turning it over in my mind so I begin to understand what is being told to me

7-I would rate my ability as

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

8-And, I would rate my level of confidence for doing this as

Not confident					Extremely confident
0%	20%	40%	60%	80%	100%

For really understanding what I have been told by a health professional

9-I would rate my ability as

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

10-And, I would rate my level of confidence for doing this as

Not confident					Extremely confident
0%	20%	40%	60%	80%	100%

For being able to memorize and repeat (state it aloud) what I have been told by a health professional

11-I would rate my ability as

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

12-And, I would rate my level of confidence for doing this as

Not confident					Extremely confident
0%	20%	40%	60%	80%	100%

For being able to ask questions that will help me to better understand, or completely understand what a health professional has explained to me

13-I would rate my ability as

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

14-And, I would rate my level of confidence for doing this as

Not confident					Extremely confident
0%	20%	40%	60%	80%	100%

For making the best health decisions for myself, deciding what actions I should take, and telling a health professional what I have decided to do, need to do, or prefer to do
15-I would rate my ability as

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

16-And, I would rate my level of confidence for doing this as

Not confident					Extremely confident
0%	20%	40%	60%	80%	100%

PART V: PROSTATE CANCER SCREENING EMPOWERMENT SCALE MEASURING STAGE OF CHANGE AND SELF-EFFICACY FOR FOUR BEHAVIORS—PRE-VIDEO (PCS-ES-M-SOC-SE-PRE-V-4)

Please answer the following questions:

Subscale 1: Receiving an Annual Physical Examination

1.) When it comes to the behavior of ***going to see a medical provider and getting a physical examination at least once a year***, check the following that most applies to you:
_____I am not thinking of doing this behavior at all.
_____I am thinking about doing this behavior.
_____I am preparing to do this behavior.
_____I have been doing this behavior for **less than six (6) months.**
_____I have been doing this behavior for **more than six (6) months.**

2.) When it comes to the behavior of ***going to see a medical provider and getting a physical examination at least once a year***, how confident are you in performing this behavior:
____0% confident ____20% confident ____40% confident
____60% confident ____80% confident ____100% confident

Subscale 2: Discussing with Medical Provider Screening for Prostate Cancer Via a Digital Rectal Exam

1.) When it comes to the behavior of ***discussing with your medical provider about whether you should receive a digital rectal examination (i.e. the physician inserts his finger into your anus to check your prostate) to screen for prostate cancer***, check the following that most applies to you:

_____I am not thinking of doing this behavior at all.
_____I am thinking about doing this behavior.
_____I am preparing to do this behavior.
_____I have been doing this behavior for **less than six (6) months.**
_____I have been doing this behavior for **more than six (6) months.**
_____NA, I have prostate cancer—already know my status

2.) When it comes to the behavior of ***discussing with your medical provider about whether you should receive a digital rectal examination (i.e. the physician inserts his finger into your anus to check your prostate) to screen for prostate cancer***, how confident are you in performing this behavior:

____0% confident ____20% confident ____40% confident
____60% confident ____80% confident ____100% confident
____Not applicable. I do not have sex like this.
____NA, I have prostate cancer—already know my status

Subscale 3: Discussing with Medical Provider Screening for Prostate Cancer Via a PSA Test

1.) When it comes to the behavior of ***discussing with your medical provider about whether you should receive a PSA test to screen for prostate cancer***, check the following that most applies to you:

_____I am not thinking of doing this behavior at all.
_____I am thinking about doing this behavior.
_____I am preparing to do this behavior.
_____I have been doing this behavior for **less than six (6) months.**
_____I have been doing this behavior for **more than six (6) months.**
_____NA, I have prostate cancer—already know my status

2.) When it comes to the behavior of ***discussing with your medical provider about whether you should receive a PSA test to screen for prostate cancer***, how confident are you in performing this behavior:

____0% confident ____20% confident ____40% confident
____60% confident ____80% confident ____100% confident
____NA, I was born HIV positive—already know my status
____NA, I have prostate cancer—already know my status

Subscale 4: Spreading Awareness among other African American Men about the Need for Prostate Cancer Screening

1.) When it comes to the behavior of ***spreading awareness among other African American men about the need for prostate cancer screening*,** check the following that most applies to you:

_____I am not thinking of doing this behavior at all.
_____I am thinking about doing this behavior.
_____I am preparing to do this behavior.
_____I have been doing this behavior for **less than six (6) months.**
_____I have been doing this behavior for **more than six (6) months.**
_____NA, I have prostate cancer—already know my status

2.) When it comes to the behavior of ***spreading awareness among other African American men about the need for prostate cancer screening*,** how confident are you in performing this behavior:

____0% confident ____20% confident ____40% confident
____60% confident ____80% confident ____100% confident
____NA, I was born HIV positive—already know my status
____NA, I have prostate cancer—already know my status

PLEASE CLICK THIS LINK AND WATCH THE AVATAR VIDEO – TAKING ABOUT 5 MINUTES.

NOW, PLEASE ANSWER THE QUESTIONS THAT FOLLOW

PART VI: DOSE OF EXPOSURE TO VIDEO (DOE-TV-1)

1) Please select one of the following:

- □ ____I watched none of the video
- □ ____I watched some of the video
- □ ____I watched most of the video
- □ ____I watched all of the video

PART VII: RATE THE VIDEO (RTV-1)

1. In terms of the information shared in the video, how do you rate the video:

Very Poor	Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5	6

PART VIII: PROSTATE CANCER SCREENING EMPOWERMENT SCALE MEASURING STAGE OF CHANGE AND SELF-EFFICACY FOR FOUR BEHAVIORS—POST-VIDEO (PCS-ES-M-SOC-SE-POST-V-4)

Please answer the following questions:

Subscale 1: Receiving an Annual Physical Examination

1.) When it comes to the behavior of ***going to see a medical provider and getting a physical examination at least once a year***, check the following that most applies to you:

_____I am not thinking of doing this behavior at all.
_____I am thinking about doing this behavior.
_____I am preparing to do this behavior.
_____I have been doing this behavior for **less than six (6) months.**
_____I have been doing this behavior for **more than six (6) months.**

2.) When it comes to the behavior of ***going to see a medical provider and getting a physical examination at least once a year***, how confident are you in performing this behavior:

____0% confident ____20% confident ____40% confident
____60% confident ____80% confident ____100% confident

Subscale 2: Discussing with Medical Provider Screening for Prostate Cancer Via a Digital Rectal Exam

1.) When it comes to the behavior of ***discussing with your medical provider about whether you should receive a digital rectal examination (i.e. the physician inserts his finger into your anus to check your prostate) to screen for prostate cancer***, check the following that most applies to you:

_____I am not thinking of doing this behavior at all.
_____I am thinking about doing this behavior.
_____I am preparing to do this behavior.
_____I have been doing this behavior for **less than six (6) months.**
_____I have been doing this behavior for **more than six (6) months.**
_____NA, I have prostate cancer—already know my status

2.) When it comes to the behavior of ***discussing with your medical provider about whether you should receive a digital rectal examination (i.e. the physician inserts his finger into your anus to check your prostate) to screen for prostate cancer***, how confident are you in performing this behavior:

____0% confident ____20% confident ____40% confident
____60% confident ____80% confident ____100% confident
____Not applicable. I do not have sex like this.
____NA, I have prostate cancer—already know my status

Subscale 3: Discussing with Medical Provider Screening for Prostate Cancer Via a PSA Test

1.) When it comes to the behavior of ***discussing with your medical provider about whether you should receive a PSA test to screen for prostate cancer***, check the following that most applies to you:

_____I am not thinking of doing this behavior at all.
_____I am thinking about doing this behavior.
_____I am preparing to do this behavior.
_____I have been doing this behavior for **less than six (6) months.**
_____I have been doing this behavior for **more than six (6) months.**
_____NA, I have prostate cancer—already know my status

2.) When it comes to the behavior of ***discussing with your medical provider about whether you should receive a PSA test to screen for prostate cancer***, how confident are you in performing this behavior:

____0% confident ____20% confident ____40% confident
____60% confident ____80% confident ____100% confident
____NA, I was born HIV positive—already know my status
____NA, I have prostate cancer—already know my status

Subscale 4: Spreading Awareness among other African American Men about the Need for Prostate Cancer Screening

1.) When it comes to the behavior of ***spreading awareness among other African American men about the need for prostate cancer screening*****,** check the following that most applies to you:

_____I am not thinking of doing this behavior at all.
_____I am thinking about doing this behavior.
_____I am preparing to do this behavior.
_____I have been doing this behavior for **less than six (6) months.**
_____I have been doing this behavior for **more than six (6) months.**
_____NA, I have prostate cancer—already know my status

2.) When it comes to the behavior of ***spreading awareness among other African American men about the need for prostate cancer screening*****,** how confident are you in performing this behavior:

____0% confident ____20% confident ____40% confident
____60% confident ____80% confident ____100% confident
_____NA, I was born HIV positive—already know my status
_____NA, I have prostate cancer—already know my status

PART IX: INTENTION TO ENGAGE IN DIFFUSION OF THE INNOVATION OF WATCHING THE AVATAR VIDEO (DIWV-2)

1-Will you recommend the avatar video to other men?

- ☐ Yes
- ☐ No

2- Why would you recommend or not recommend the video
cartoon to others? Please explain why or why not. What other comments do you have?

_____

END OF SURVEY: THANK YOU AND SHARE WITH OTHERS!

We invite you to text message, e-mail, and tweet other men to
Go to www.surveymonkey.com/s/AAProstateCancer/ **to take a survey & rate a video for a chance to win a $300, $200, or $100 prize**

TO HAVE A CHANCE TO WIN A PRIZE!
Click the link below:

_____

Thanks for completing the survey and clicking the FINAL link. You now have a 3 in 200 chance of winning a prize in our random drawing for a bar-coded gift certificate to www.Amazon.com (e.g. either a $300 prize, $300 prize, or $100 prize.

_____

Appendix E

Study E-Mail

IF YOU ARE AN AFRICAN AMERICAN MAN AGE 18 OR ABOVE YOU ARE INVITED TO TAKE A SURVEY

THIS STUDY'S IRB PROTOCOL NUMBER

The Research Group on Disparities in Health within the Department of Health and Behavior Studies at Teachers College, Columbia University, in New York, New York is studying how African American men evaluate and rate a brief Avatar (cartoon-like) video on prostate cancer, while also obtaining important background information through a survey.

- First, we ask you to spend about 30 minutes answering an online survey
- Then we want you to spend 5 minutes watching an avatar/cartoon video
- Finally, we ask you to spend about 10 minutes rating the video and answering final questions
- Participation in this survey is limited to the first 200 men
- After 200 men complete the survey, the computer program will automatically close the survey and send out bar-coded gift certificates for use at www.Amazon.com to three randomly chosen e-mail accounts ($300, $200 or $100) without in any way linking your identity to the survey results
- Please go to the link below ("Go towww.surveymonkey.com/s/AAProstateCancer/) to view the informed consent, learn about your rights as a participant and proceed to the survey.
- We invite you to e-mail, text, and tweet other men you know:

  "Go to www.surveymonkey.com/s/AAProstateCancer/ to take a survey & rate a video for a chance to win a $300, $200, or $100 prize."

  NOTE: Participants have a 3 in 200 chance of winning a $300, $200, or $100 bar-coded gift certificate for use on www.Amazon.com.

THANK YOU FOR YOUR PARTICIPATION!

WILLIAM HALL, M.P.H., **and Doctoral Candidate, Department of Health and Behavior Studies, Pre-Doctoral Fellow, Research Group on Disparities in Health, Teachers College, Columbia University, Box 114, 525 W. 120th Street, New York, NY 10027; wah47@tc.columbia.edu**

BARBARA C. WALLACE, Ph.D., **Director, Research Group on Disparities in Health, Professor of Health Education, Clinical Psychologist, Department of Health and Behavior Studies, Teachers College, Columbia University, Box 114, 525 W. 120th Street, New York, NY 10027; Bcw3@tc.columbia.edu; Study Contact Number: 267-269-7411**

Appendix F

Study Flyer

IF YOU ARE AN AFRICAN AMERICAN MAN AGE 18 OR ABOVE YOU ARE INVITED TO TAKE A SURVEY

THIS STUDY'S IRB PROTOCOL NUMBER

The Research Group on Disparities in Health within the Department of Health and Behavior Studies at Teachers College, Columbia University, in New York, New York is studying how African American men evaluate and rate a brief Avatar (cartoon-like) video on prostate cancer, while also obtaining important background information through a survey.

- First, we ask you to spend about 30 minutes answering an online survey
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- Finally, we ask you to spend about 10 minutes rating the video and answering final questions
- Participation in this survey is limited to the first 200 men
- After 200 men complete the survey, the computer program will automatically close the survey and send out bar-coded gift certificates for use at www.Amazon.com to three randomly chosen e-mail accounts ($300, $200 or $100) without in any way linking your identity to the survey results
- Please go to the link below ("Go towww.surveymonkey.com/s/AAProstateCancer/) to view the informed consent, learn about your rights as a participant and proceed to the survey.
- We invite you to e-mail, text, and tweet other men you know:
  "Go to www.surveymonkey.com/s/AAProstateCancer/ to take a survey & rate a video for a chance to win a $300, $200, or $100 prize."
  NOTE: Participants have a 3 in 200 chance of winning a $300, $200, or $100 bar-coded gift certificate for use on www.Amazon.com.

THANK YOU FOR YOUR PARTICIPATION!

WILLIAM HALL, M.P.H. **and Doctoral Candidate, Department of Health and Behavior Studies, Pre-Doctoral Fellow, Research Group on Disparities in Health, Teachers College, Columbia University, Box 114, 525 W. 120th Street, NY, NY 10027; wah47@tc.columbia.edu**
BARBARA C. WALLACE, Ph.D., **Director, Research Group on Disparities in Health, Professor of Health Education, Clinical Psychologist, Department of Health and Behavior Studies, Teachers College, Columbia University, Box 114, 525 W. 120th Street, NY, NY 10027; Bcw3@tc.columbia.edu; Study Contact Number: 267-269-7411**

Go to www.surveymonkey.com/s/AAProstateCancer/ **Please complete the survey and rate the videos. You could win a $300, $200 or $100 prize!**	**Go to** www.surveymonkey.com/s/AAProstateCancer/ **Please complete the survey and rate the videos. You could win a $300, $200 or $100 prize!**	**Go to** www.surveymonkey.com/s/AAProstateCancer/ **Please complete the survey and rate the videos. You could win a $300, $200 or $100 prize!**	**Go to** www.surveymonkey.com/s/AAProstateCancer/ **Please complete the survey and rate the videos. You could win a $300, $200 or $100 prize!**

Appendix G

The Study Text Message/Tweet

"Go to www.surveymonkey.com/s/AAProstateCancer/ to take a survey & rate a video for a chance to win a $300, $200, or $100 prize."

Appendix H

IRB Approval Letter

TEACHERS COLLEGE
COLUMBIA UNIVERSITY

Teachers College IRB *Exempt Study Approval*

To: William Hall
From: Karen Froud, IRB Chair
Subject: IRB Approval: 15-125 Protocol
Date: 12/17/2014

Dear William,

Thank you for submitting your study entitled, "*AN INNOVATIVE APPROACH TO REDUCING PROSTATE CANCER HEALTHCARE DISPARITIES FOR AT RISK AFRICAN AMERICAN MEN: DEVELOPMENT AND EVALUATION OF AN ONLINE E-HEALTH AVATAR VIDEO TAILORED TO BE CULTURALLY APPROPRIATE*;" the IRB has determined that your study is **Exempt** from committee review (Category **2**).

Please keep in mind that the IRB Committee must be contacted if there are any changes to your research protocol. The number assigned to your protocol is **15-125**. Feel free to contact the IRB Office by using the "Messages" option in the electronic Mentor IRB system if you have any questions about this protocol.

Please note that your IRB protocol number must appear on all research materials, and you must use a copy of the stamped version of your flyer. You can pick-up the hard-copy of this stamped flyer from the IRB office. You can retrieve a PDF copy of this approval letter from the Mentor site.

Best wishes for your research work.

Sincerely,

Karen Froud, Ph.D.
Associate Professor of Neuroscience & Education
IRB Chair

Attachments:
- Hall_Stamped Flyer.pdf

Appendix I

Prostate Cancer Script

SCENE/ SETTING: A park with greenery, etc…

CHARACTERS: Three Black men are walking around, sitting down, standing up, gesturing with their arms and hands, showing emotion as they talk. The Three Black men are: **Dave** (BROWN-SKINNED); **Kwame** (DARK-SKINNED); and, **Steve** (LIGHT-SKINNED):

Dave: How are you?

Kwame: Good, man.

Steve: Good. How *you* doing, Dave?

Dave: My brother was diagnosed with prostate cancer.

Steve: I keep hearing the same story: Black men getting prostate cancer—like my best friend.

Dave: Yeah, my brother went for his annual physical, had a Digital Rectal Examination, and his PSA test. His PSA was high, so he was called back for a biopsy. The biopsy was positive for prostate cancer.

Kwame: How old is he?

Dave: 48.

Dave: Our father died from prostate cancer, so we are considered at high risk. We have been getting physical examinations *every* year—since age 40. That includes having a Digital Rectal Examination and PSA test. This time my brother's PSA test was high. So, he had the biopsy that found the cancer.

Steve: My best friend died from prostate cancer at age 54.

Kwame: My uncle and my cousin died from prostate cancer. Still, I have not had a physical exam in 7 years.

Steve: Why?

Kwame: I'm afraid. Plus, I don't want a doctor putting their finger inside my anus, or talking down to me, or explaining things by talking way above my head—like they are doing it on purpose. Plus, the last doctor made me wait longer than all

the other patients—seeing people who came in AFTER me. So, I walked out. And, I have not been back in 7 years.

Steve: You have to get over that, man. Every Black man needs to have an annual physical.

Dave: *All* African American men are at risk for prostate cancer—compared to all the other racial and ethnic groups in the United States. Black men get prostate cancer at the highest rates, *and die* from prostate cancer at the highest rates.

Steve: The rate for Black men dying from prostate cancer is *between double to triple the risk*—compared to all the other racial and ethnic groups in this country.

Kwame: And, we receive the worse medical care—if you ask me.

Dave: Yes! For example, when my brother was diagnosed with prostate cancer, his doctor recommended *watchful waiting*—which really means doing nothing, or just waiting and watching the condition.

Kwame: A lot of brothers are just not properly educated on all the treatment options available—because of racism, talking down to Black men, and, physicians not taking the time to explain all the treatment options in ways that can be easily understood.

Steve: Disrespect. Sometimes doctors assume a Black man does not have the kind of insurance coverage to pay for treatment options.

Dave: I was there when my brother received education on treatment options for his prostate cancer. When the doctor recommended *watching waiting*—or just waiting and watching the condition—I got my brother out of there, fast!

Steve: Good!

Dave: I Googled TOP DOCTORS, searched on the Internet, and I asked around. I found a really good urologist who takes time to explain things, and treats Black men with respect.

Steve: Like night and day—finally being treated with respect!

Dave: Yes! Then, I found a really good oncologist—a prostate cancer specialist. The urologist and oncologist consulted about my brother's case. We felt really respected. Now, my brother is thinking about surgery to remove his prostate. Watchful waiting is too dangerous, given his being African American, plus his family history, and his stage of cancer.

Kwame: My cousin who died from prostate cancer had been advised to do *watchful waiting*. That was some bad advice, man! The prostate cancer spread to his bones. His leg bone was so thin it was in danger of snapping. He had to start using a wheelchair. Plus, he could barely walk anyway.

Steve: They don't want to tell you that watchful waiting can mean prostate cancer spreading—metastasizing—throughout your entire skeletal and lymphatic system.

Dave: Exactly! I found a year 2002 article by Dr. Ramsis Benjamin. I memorized some facts: Lower back pain or headache can be a sign of prostate cancer spreading from the bone to the central nervous system—or what they call *metastatic prostate cancer*. Once you have *metastatic prostate cancer*, for 90% of patients it spreads to the spine, for 50% it spreads to the lungs, and for 25% it spreads to the liver.

Kwame: That is what I saw in my cousin!

Dave: When it spreads to the spine, the back pain can be so bad that reclining or lying down does not relieve it; and, after the pain starts, there can be muscle weakness, and difficulty walking. In other words, unless you get early treatment you can end up in a wheel chair, unable to walk.

Kwame: You are describing my cousin! Nobody tells you how all that can happen. "Just do watchful waiting" is all they say. Yeah, and watch yourself end up in a lot of pain, or a wheelchair, then dead.

Steve: They say that prostate cancer spreading to the brain is rare, but it happened to my best friend.

Dave: Dr. Benjamin cites research going back to before they did regular PSA testing. The average time from the diagnosis of prostate cancer to a metastasis or spreading to the bone was 19 months; 35 months for it spreading to the lungs; and 60 months for it spreading to the brain.

Steve: Then, when you have brain cancer you can start having seizures. And, once prostate cancer has spread to the brain, you usually have just 7-8 months left before you die. It was hard watching my best friend die. He was 54.

Kwame: Wow! You are describing the last 5 years of my cousin's life before we buried him at age 52!

Dave: I think some doctors cannot imagine a Black man wanting to live more than wanting to have sex. Sometimes they put so much emphasis on the possibility of not being able to have an erection after surgery or some of the other treatments. Or, you might have urinary incontinence.

Steve: Like all a Black man cares about is having sex!

Kwame: I think my dead cousin would have preferred not being able to have an erection, or even having some urine leak out his penis—to being dead!

Steve: The same goes for my best friend. But, Kwame, you have to know that there are some great medical doctors out there.

Dave: Yeah, I have become expert at finding them. And, if they cannot treat a Black man with respect, and explain things in a way I can understand, then I am out of there.

Kwame: Well, I guess I have to go back and starting getting my annual physical examination.

Dave: Definitely, man. I have a referral for you. Every Black man MUST have an annual physical examination. And, that annual physical examination MUST include bending over and having the Digital Rectal Examination; plus your blood must be taken for the PSA test. Then, you have to make sure you get the results of your PSA test.

Steve: Yes. Every African American man is supposed to begin having an annual PSA test starting at age 40—just because the risk is so high for our racial group. Then, if you have a family history of prostate cancer, or you were exposed to Agent Orange in Vietnam, then you are at the HIGHEST RISK for prostate cancer.

Dave: So, even if a Black man is at the highest risk for experiencing racism and discrimination in the healthcare system, you have to know to shop around until you find a doctor who can give some real respect to you.

Kwame: That is where I am now. I walked out of that doctor's office 7 years ago. Now, it is time to go back and work with a professional who can truly respect me.

Steve and Dave: YES!